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EDITION: NINETEEN HUNDRED THREE

Illustrated Catalogue of *Hand and Power Pumps,*

HYDRANTS, HYDRAULIC
RAMS, WELL FIXTURES
GARDEN ENGINES
ETC., ETC.



MANUFACTURED BY

W. & B. DOUGLAS

MIDDLETOWN, CONN.

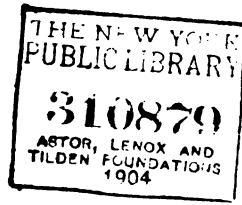
U. S. A.



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JOHN STREET

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Incorporated 1859



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Middletown, Conn., U. S. A.

T O T H E T R A D E

WE are pleased to present herewith the 1903 edition of our General Catalogue. Without resorting to the superlatives usually found in pump catalogues, we simply call your attention to a record of over seventy years' cordial relations with our customers in all parts of the world. Our line is constantly increasing, and we would solicit your inquiries in regard to any kind of installation.

We are better equipped than ever to execute your commands, and shall do all in our power to merit a continuance of the same.

Very respectfully yours,

W. & B. DOUGLAS.

TERMS

This Price List cancels all former ones, and is subject to change without notice.

All orders will be filled according to specifications in the catalogue, unless otherwise instructed.

When ordering be sure to specify the Figure and Number, or size. It is not necessary to mutilate this book.

Discount sheets are at the disposal of the trade only, and are subject to change without notice.

Claims for allowance will not be considered unless presented immediately upon the receipt of goods.

Breakages will not be made good unless it can be shown that our inspection or packing is at fault.

— Loose pumps shipped at buyers' risk.

Strangers or individuals having no commercial rating should accompany order with cash or satisfactory reference.

Several old styles of pumps have been taken from the list and can be furnished only by special arrangement.

Estimates and Recommendations for special installations will be cheerfully furnished, and if the goods are properly set and cared for, we will guarantee all that we claim for them.

GENERAL HINTS

When writing for information our reply will be greatly expedited if we can have before us the answers to the following questions:

- (a) General idea of duty to be performed and location of pump.
- (b) Number of gallons required per hour.
- (c) Diameter of well and distance from ground to low-water mark.
- (d) Number of feet vertical suction-pipe.
- (e) Number of feet horizontal suction-pipe.
- (f) Height of discharge above pump.
- (g) Estimated length of discharge-pipe.
- (h) Dimensions of pipe already laid, if any.
- (i) If for boiler-feeding, or similar duty, give pressure.
- (k) If pumping chemicals or other foreign matter, give nature of substance.
- (l) If a power pump, give speed of nearest shaft, also diameter and face of pulley, if in place.
- (m) State whether pump is to be used continually, or only a short time each day.
- (n) If electric power is to be used, state whether pump is to be driven by belt, ordinary spur gear, or worm gear.
- (o) Give voltage and nature of current to be used.
- (p) If alternating current, state whether two- or three-phase, and number of cycles.

A sketch showing principal dimensions is a material assistance in selecting a pump for your service.

DEFINITIONS AND SUGGESTIONS

THE CYLINDER OR WORKING-BARREL is that part of the pump in which the plunger works. It should be perfectly smooth to avoid unnecessary wear on the packing. A cast-brass or a brass-lined cylinder is less subject to corrosion than iron and is recommended in all cases where the water is free from grit. Special material and packing is necessary for most liquids other than cold water.

It is best to have the cylinder submerged whenever possible, for then the valves will be always primed and imperfections in the piping will not cause so much trouble.

THE PISTON OR PLUNGER proper is the active means for raising the water. It should nearly fill the cylinder without packing and should be a pretty snug fit after it is packed. The piston-seat may be tested by holding it upside down by means of the valve-stem, and filling the piston with water.

THE LOWER VALVE sustains the column of water when the piston is on the down-stroke and also when through pumping. The valve-seat should be kept clean and smooth and the valve should have perfect contact throughout its circumference.

THE SUCTION-PIPE supplies the water to the cylinder. Its diameter should be one-half the diameter of cylinder and its vertical height not over 25 feet at sea-level. When used in wells, it is ordinarily extended to within a foot of the bottom. A check-valve is desirable on long suction-pipes where it

is unnecessary to guard against freezing. A strainer (Fig. 199 or 358) should be used to prevent clogging. The suction-pipe must be perfectly sound and tightly screwed together, otherwise the pump is useless. It should be protected from frost and rise steadily toward the pump, with no low spots, and as few turns as possible. If the water flows toward the pump with much head, springs must be provided to keep the valves from floating. It is best to let hot water flow into the pump, for if there is a long suction lift, or a high piston speed, the pump will draw nothing but vapor. If the suction-pipe is to be hose, it must be wired to prevent collapsing on the larger sizes.

HE CHECK-VALVE, used on long suction-pipes, is an additional assistance to the lower valve, mentioned above, and should be cared for in the same manner. It is usually combined with a strainer and placed on the bottom of the pipe. (See Fig. 113.)

HE INTERMEDIATE PIPE on a set-length pump connects the working cylinder with the Upper Section or Standard. The rod usually works inside of this pipe. The intermediate pipe may, in some cases, be smaller than the suction-pipe, but a liberal diameter produces much less friction, which is especially noticeable in long pipes. A set-length pump is rendered Anti-Freezing by drilling a hole in the intermediate pipe about three-sixteenths-inches diameter, three feet below the ground level. In very cold climates this hole may need to be lower.

HE STANDARD OR UPPER SECTION is that part of a set-length pump which shows above the ground.

HE ROD AND STUFFING-BOX should be frequently adjusted to prevent wear, noise and lost motion; this is particularly necessary with power pumps. Too tight an adjustment of the stuffing-box should be avoided, for it consumes extra power and is liable to scar the rod. Just enough pressure to avoid leaking is all that is necessary.

HE AIR-BARREL ON FORCE PUMPS increases the ease of operation and steadiness of flow. It is desirable on both suction and discharge, although usually fitted to the discharge only. In many pumps it is a separate fixture, as in Fig. 91 and Fig. 432; in some it is contained in the upper part of the cylinder, as in Figs. 410 and 281, while in Fig. 259 it is formed in the hollow piston-rod.

HE DISCHARGE-PIPE carries the water from the pump to point of discharge. In many cases it may safely be a size smaller than the suction-pipe, but the pump will work much more easily if a liberal diameter is used, especially on long pipes. Generally a three-inch cylinder should have not less than one and one-quarter-inch discharge-pipe.

SOME DIFFICULTIES AND REMEDIES

PUMP REFUSES TO DRAW WATER, ALTHOUGH PRIMED.

Possible Causes:

- (1) No water in the well—A commoner reason than many suspect.
- (2) Pump cylinder imperfectly or unevenly fastened to valve-seat.
- (3) Vertical suction distance too great, that is, over twenty-five feet at sea-level.

- (4) Suction-pipe not perfectly tight—Listen for hissing sound and see that there are no cracks nor loose joints.
- (5) Imperfect plunger—See that poppet works without getting caught; test with water as indicated on page 4, and put on new packing if old one is worn or stiff.
(If poppet is caught, a rap on the cylinder or jerking the rod will often start it.)
- (6) Lower valve imperfect—Make valve-seat clean and smooth, and put in new leather if old one is stiff or worn.

PUMP LOSES WATER WHEN THROUGH PUMPING.

If this takes place rapidly, it is accompanied with a gurgling sound.

Cause: Imperfect lower valve—see (5) above.

PUMP WORKS HARD, PERHAPS MAKES A GROANING SOUND.

Possible Causes:

- (1) Too tight an adjustment or imperfect alignment of rod, stuffing-box or plunger; this must not be confused with the stiffness of new pumps just out of the factory.
- (2) Water drawn down to extreme suction distance, say twenty-five or thirty feet, vertically.
- (3) Flow of water restricted, either by small diameter of pipe; foreign matter choking the pipe or inlet; valves prevented from rising to normal height or the piston speed may be too high for the valve area (applies to power pumps). Pipes can often be cleaned by attaching a force pump and driving water through them; this applies also to the choking of strainers and drive-well points.
- (4) If pumping from a city main, the supply may be inadequate. In this case allow city main to fill an open tank or cistern and then pump from that.

POUNDING INSIDE OF PUMP.

Possible Causes:

- (1) Valves loose or broken.
- (2) Valve lift too high, causing a decided blow when seating against heavy pressures.
- (3) Suction-pipe restricted.
- (4) Air in the cylinder.

PRESSURE PUMP REFUSES TO RAISE THE PRESSURE.

Possible Causes:

- (1) Air in the cylinder or discharge-pipe—See that pump and pipes are full of water, by opening suitable pet-cocks, etc., then apply pressure.
- (2) Check-valve may not hold properly.

— — — — —

Formulas, Tables of Capacity, etc., in back part of catalogue.

Telegraphic Code FOR THE ACCOMMODATION OF OUR CUSTOMERS

¶ ALL goods shown in this catalogue are designated by a figure and number, and given a Cipher Word by which they may be ordered by telegraph. By the use of these words in connection with our Telegraphic Code, considerable expense may be saved.

DIRECTIONS FOR USING CODE

Great care should be taken in writing Cipher messages. Begin each Cipher word with a capital letter; all i's should be dotted and all t's crossed. Where a blank space (.....) occurs in a sentence (of the Code), the word to supply the blank space should follow the Cipher word expressing such sentence, and if more than one blank space occurs, the supplying words should follow in their order after the Cipher word.

Our Cable Address is: "DOUGLAS," MIDDLETOWN.

CIPHER CODE

REGARDING GOODS IN STOCK

PACER.....Have you in stock?
PACKET.....How many have you in stock?
PADDLER.....How soon could you furnish?
PAGAN.....We have in stock.
PAINFUL.....We have none in stock.

PALACE.....We have in stock; will ship at once.
PALING.....We have none in stock but could furnish soon.
PALTRY.....We have no more in stock.
PANORAMA...If not in stock, make and ship.

REGARDING ORDERS AND SHIPMENTS

PARAPET.....When can you ship?
PARASOL.....When will you ship?
PARENT.....Have you shipped?
PARISH.....Have you shipped our order of

PIEBELIAN....We can ship on receipt of order.
PLUCK.....If ordered at once, could ship

PARODY.....When will you ship our order of

POLITIC.....We could probably ship.
POLKA.....We have entered your order.
POMADE.....We have no order.
POMMEL.....Your order not received. Please
PONDER.....All we can spare. [repeat.
PONTIFF....We have shipped your order of

PARROT.....How soon can you complete our order of

PONTON.....All your orders are now filled.
POPULAR.....We are now working on your order.
POPULOUS...Telegram received after goods were shipped.

PARSLEY.....How soon could you furnish if ordered at once?
PARTRIDGE...Why is our order delayed?
PASSIVE.....Can you ship earlier than
PASTE.....What order number do you refer to?
PASTILLE....Do not ship our order until further notice.

PORCH.....We can not ship for a week or two.
PORPOISE...Today or tomorrow.

PASTURE.....Enter our order, specifications follow.
PATERNAL....Alter our order to ———. [low.
PATHOS.....Duplicate order ———.

PORTRAY.....The last of this week.
POSTERITY...In about a week.

PATRIOT.....Hurry all back orders.
PECTORAL....Hurry our order. Very important.
PEDIGREE....Hurry forward balance of order.

POSTILLION...The first of next week.
POTASH.....The middle of next week.

PEERAGE.....Increase my order to ———.
PELICAN.....Will send regular order by mail.
PENANCE.....You may fill part of the order.

POTATO.....The last of next week.
POULTRY.....In about two weeks.

PENMAN.....Cancel order ———.
PENBION.....Telegraph us if you can not ship within time mentioned.

PRAIRIE.....In about three weeks.
PRANCE.....About sixty days.

PENSIVE.....Ship what you have, balance to follow.

PRATTLE.....About ninety days.
PRECEPT...Order received too late to ship

PEONY.....Order must be shipped complete.
PEPPER.....Ship at once by freight.

PREFACE.....Order declined. [today.
PREFIX.....Order cancelled.

PERCUSSION..Ship at once by express.
PERFUME.....Ship by quickest route.

PRELATE.....Order accepted.
PREMIER.....Your order entirely ready.

PERIL.....Ship by rail to ———.
PERPLEX.....Ship by steamer to ———.

PRESERVE....Order received which will have best attention.

PERVERT.....Ship from New York via ———.
PESTLE.....Ship from Boston via ———.

PRESTO.....Order shipped promptly. Will send tracer.

PETRIFY.....Ship via ———.
PETULANT....Ship by steamer via Liverpool.

PRETTY.....We hold order for further advice.
PRIEST.....We can not accept your order.

PHALANX.....Ship by sailing vessel.
PHONETIC....Trace shipment ———.

PRIMARY.....We consider all former orders cancelled.

PHOSPHATE...Have you traced shipment?
PIANO.....Have you shipped us any ———?

PRIMROSE...Please send shipping instructions.
PRINCESS....Rate of freight to ——— is ———.

PICKEREL....What is the lowest freight to ———?
PIGEON.....Insure goods on order ——— at actual value.

PRISM.....Can not obtain through rate of freight to ———.

PIGMENT.....Insure goods on order ——— at 10% above value.

PRIVATEER...Answer by telegraph at our expense.
PRIZE.....Your telegram was received in time.

PLATOON.....We can ship.
PLAYMATE...We will ship.

PROBATE.....Your letter was received in time.
PROBE.....Your telegram was not received in time.

PROCLAIM...Your letter was not received in time.

REGARDING CLASSES OF GOODS

PROPEL Cistern Pumps.
 PROPHECY Pitcher Spout Pumps.
 PROPOUND Set-Length Lift Pumps.
 PROSAIC Set-Length Force Pumps.
 PROTECTOR Hand and House Force Pumps.
 PROTRACT Deep Well Standards.
 PROVERB Windmill Standards.
 PROVIDENT Windmill Pumps.
 PROVINCE Iron Cylinders (Working Sections).
 PROVISION Brass-lined Iron Cylinders.
 PROVOKE Cast Brass Cylinders.
 PROWESS Brass Tube Cylinders.
 PRUSSIAN Rotary Pumps.
 PSALM Double-acting Force Pumps.
 PUCKER Horizontal Force Pumps.
 PUGILIST Hydraulic Rams.
 PULPIT Garden and Fire Engines.
 QUACK Diaphragm Pumps.
 QUADRANGLE Repairs for Pumps.
 QUADRANT Triplex Pumps.
 QUADRATIC Electric Pumps.
 QUADRILLE Check Valves.
 QUADROON Well Points.
 QUAFF Well Chain.
 QUAGMIRE Wood Tubing.
 QUAHOG Wood Curbs.
 QUAIL Copper Pumps.
 QUAIN Hydrants.
 QUAKER Street Washers.
 QUALM Boiler Pumps.
 QUARANTINE Spraying Pumps.

QUARTETTE Pneumatic Pumps.
 QUARTO Grindstone Frames.
 QUAYER Fitted with Metallic Valves.
 QUAY Fitted with Spring Piston and Metallic Valves.
 QUELL Fitted with Inside Attachments.
 QUENCHER Fitted with Hose Attachments.
 QUEST Fitted for Lead Pipe.
 QUIET Fitted for Iron Pipe.
 QUINCE Fitted for Lead or Iron Pipe.
 QUININE With Soldering Tubes.
 QUINSY Without Soldering Tubes.
 QUINTAL With Cock on Spout.
 QUITCLAIM With ——— feet of Hose, and Discharge Nozzle.
 QUIVER Fitted for 1-inch Suction-Pipe.
 QUIXOTIC " 1½ " "
 QUIZZING " 1½ " "
 QUIN " 1½ " "
 QUORUM " 2 " "
 QUOTIENT " 2½ " "
 RABBIT " 3 " "
 RABID " 1 Discharge-Pipe.
 RACCOON " 1½ " "
 RACKET " 1½ " "
 RADIANCE " 2 " "
 RADISH " 2½ " "
 RAFFLE " 3 " "
 RAGGED With Windmill Top.
 RAIMENT With ——— feet Set-Length.

REGARDING QUOTATIONS AND TERMS

RANSACK At what price can you furnish?
 RAPTURE At what price and how soon can you furnish?
 RASPBERRY Give us your lowest quotation on ———.
 RATTAN Is your offer of ——— still good?
 RATTLE Will you hold the quotation open?
 RAVEL Will you accept order at last quotation?
 RAVINE How long will you hold the quotation open?
 RAZOR Does the price include?
 REALM What is the best you can do?
 REBEL Can you give an approximate idea?
 REBUFF Quote by mail lowest price for ———.
 RECESS Mail best price and quickest delivery for ———.
 RECITAL Do you accept?
 RECLINE We quote, expecting immediate reply by mail.
 RECRUIT We quote, expecting immediate reply by wire.
 RECTOR In answer to your telegram we quote.
 REFEREE In answer to your letter we quote.
 REFRESH We accept order at prices named.

REFUGEE We can not accept order at prices named.
 REGAL We can not hold this quotation open.
 REGATTA All quotations on pumps are withdrawn.
 REGENT Our prices are always subject to change without notice.
 REGIMENT We can not sell the goods at the price now; quotation was for immediate acceptance.
 REHEARSAL Terms: Cash with order.
 REINDEER Terms: Cash on receipt of invoice.
 REJOICE Terms: Cash on receipt of goods.
 RELAX Terms: Sight draft will bill ladies.
 RELIGION Terms: 30 days, net.
 REMOKE Terms: 60 days, net.
 RENOVATE Terms: 2% discount for cash ten days.
 REPEAT F. O. B. Middletown.
 REPTILE F. O. B. New York.
 REQUIEM Freight prepaid to ———.
 RESCUE Freight allowance, — cents per 100 pounds.
 RESIDE No freight allowance on less than 300 pounds.

MISCELLANEOUS

RESIN Did you receive our letter of the—?
 RESOLUTE Did you receive our telegram of the—?
 RESTIVE Your letter was not received until ———.
 RETINA We have no letter from you.
 REVENGE Your message is unintelligible.
 REVERIE You have not answered our letter of the ———.
 REVIVAL You have not answered our telegram of the ———.
 REVOLT Please answer our letter of the ———.
 RHETORIC Please answer our telegram of the ———.
 RHYME Expecting a letter from you.
 RIBBON Can read your telegram by code, but do not understand it.

RIFLE Can not understand your telegram from code; repeat, using plain language.
 RIGOR What is the meaning of ——— your code?
 RINGLET Answer by telephone.
 RIPPLE Call me (us) up on telephone.
 RITUAL Can not get you by telephone.
 ROAST Can not telephone you before ———.
 ROBBER Is transaction sufficiently important for us to telephone?
 ROCKET Referring to your telephonic query.
 ROMAN Telephone not working.
 ROSARY Telephone in working order.

Revolving Stand Cistern Pumps

LIFT, 25 FEET



FIGS. 1 & 47
SCREW BASE

Figures 1 and 264 are extensively used on cisterns and shallow wells. To prevent freezing raise the brake to its extreme height, thus tripping the valves.

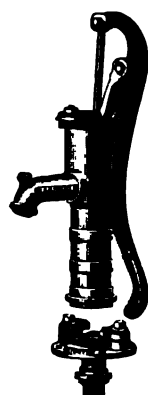
Fig. 1 has base screwed to cylinder as shown in cut, and is fitted with coupling and brass thread tube for iron pipe unless otherwise ordered.

Fig. 47 is like Fig. 1, but has brass cylinder below spout, brass valve-seat and brass piston. Same fittings as Fig. 1.

Fig. 264 has base secured to cylinder by two bolts which pass through loose ears and allow the spout to be turned in any direction.

Fig. 51 is like Fig. 264, but with brass cylinder below spout and brass piston.

Fitted for iron pipe with brass solder tube unless otherwise ordered.



FIGS. 264 & 51
BOLTED BASE

PRICES, ETC., FIGS. 1 & 47

No.	Bore Inches	Stroke Inches	Diam. Suction Pipe	Gals. per Stroke	Figure 1		Figure 47	
					Cipher	Price	Cipher	Price
0	2	3½	1	.042	Caback	\$3.50	Cargo	\$7.75
1	2¼	5	1	.072	Cabal	4.00	Carian	8.75
2	2½	5	1¼	.088	Cabalism	4.50	Caribee	10.50
3	2¾	6¼	1¼	.145	Cabalist	5.00	Caricature	14.00
4	3	6¾	1½	.171	Cabalize	5.50	Carrillon	17.00
5	3¼	7¼	1½	.217	Caballer	6.50	Carman	21.00
6	3½	7½	2	.250	Cabaret	8.00	Carmine	27.00

PRICES, ETC., FIGS. 264 & 51

No.	Bore Inches	Stroke Inches	Diam. Suction Pipe	Gals. per Stroke	Figure 264		Figure 51	
					Cipher	Price	Cipher	Price
0	2	3½	1	.042	Court	\$3.50	Carpet	\$5.25
1	2¼	5	1	.072	Courteous	4.00	Carpeting	6.00
2	2½	5	1¼	.088	Courter	4.50	Carping	7.00
3	2¾	6¼	1¼	.145	Courtesy	5.00	Carriage	8.00
4	3	6¾	1½	.171	Courtly	5.50	Carried	10.00
5	3¼	7¼	1½	.217	Courtress	6.50	Carrier	13.00
6	3½	7½	2	.250	Courtyard	8.00	Carrior	18.00
8	4	7¼	2½	.327	Cousin	12.00		
10	4½	7½	2½	.428	Cousiness	15.00		

We can furnish Figures 1 and 264 with brass-lined cylinders at a reasonable additional charge.

Extra prices to adapt for acids or hot-water use, see page 10.

Revolving Stand Cistern Pumps

LIFT, 25 FEET



FIG. 57

ONE-BOLT CONNECTION

Figure 57 has base secured to cylinder by one bolt with brass conical nut. The valve-seat is of solid brass. Fitted for iron pipe with coupling and solder tube unless otherwise ordered.

Fig. 41 is adapted for fastening to a wall or post by means of the side ears shown in cut. The valve-seat is brass-bushed, and is secured to the cylinder by two bolts passing through loose ears.

Fitted with coupling and brass thread tube for iron pipe (like Fig. 1) unless otherwise ordered.



FIG. 41

SIDE EARED

PRICES, ETC., FIGS. 57 AND 41

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	Figure 57		Figure 41	
					Cipher	Price	Cipher	Price
0	2	3¼	.042	1	Carrot	\$3.50	Capstan	\$3.50
1	2½	5	.072	1	Carroty	4.00	Capstone	4.00
2	2½	5	.088	1¼	Carrow	4.50	Capstring	4.50
3	2¾	6¼	.145	1¼	Carry	5.00	Capular	5.00
4	3	6¾	.171	1½	Carryall	5.50	Capsule	5.50
5	3¼	7¼	.217	1½	Carrying	6.50	Capsus	6.50
6	3½	7¼	.250	2	Cartagena	8.00	Captain	8.00

To avoid freezing, raise the brake to its extreme height, thus tripping the valves.

Extra net prices to adapt Figs. 1, 22, 41, 47, 51, 57, 202 and 264 for acids or hot water by adding metal valves and canvas-packed pistons; also approximate weight of complete pump, and number usually packed in hogshead:

Size	No. 0	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 8	No. 13
Extra for Metal Valves	\$1.15	\$1.25	\$1.40	\$1.50	\$1.60	\$1.75	\$1.90	\$2.10	\$2.50
Weight of Pump	15 lb.	18 lb.	22 lb.	25 lb.	33 lb.	43 lb.	52 lb.	.....	.....
Number in Hogshead	65	45	40	32	24	18	16	.....	.....

Revolving Stand Cistern Pumps

LIFT, 25 FEET



FIG. 202
BRACKET FLANGE

Figure 202 is adapted for fastening to a wall or post by means of the bracket-flange shown in cut. The valve-seat is of solid brass. The cylinder is secured to the base by two bolts passing through loose ears, which allow the spout to be turned in any direction.

Fitted for iron pipe with coupling and solder tube unless otherwise ordered.

Fig. 22 has cylinder screwed to base like Fig. 1, but the piston is arranged with guide and double rod to keep the working parts constantly in alignment, thus diminishing the wear.

Fitted with coupling and brass thread tube for iron pipe, like Fig. 1, unless otherwise ordered.



FIG. 22
DOUBLE ROD

PRICES, ETC., FIG. 202

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	Iron		Brass Cylinder Below Spout	
					Cipher	Price	Cipher	Price
0	2	3 $\frac{3}{4}$	.042	1	Compose	\$3.50	Comprint	\$5.25
1	2 $\frac{1}{4}$	5	.072	1	Composite	4.00	Comprisal	6.00
2	2 $\frac{1}{2}$	5	.088	1 $\frac{1}{4}$	Composure	4.50	Comprise	7.00
3	2 $\frac{3}{4}$	6 $\frac{3}{4}$	.145	1 $\frac{1}{4}$	Compotent	5.00	Compulsion	8.00
4	3	6 $\frac{3}{4}$	.171	1 $\frac{1}{2}$	Compound	5.50	Compulsive	10.00
5	3 $\frac{1}{4}$	7 $\frac{1}{4}$	.217	1 $\frac{1}{2}$	Comprehend	6.50	Compulsory	13.00
6	3 $\frac{1}{2}$	7 $\frac{1}{4}$	.250	2	Compress	8.00	Computator	18.00

PRICES, ETC., FIG. 22

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
0	2	3 $\frac{3}{4}$	.042	1	Camphene	\$4.50
1	2 $\frac{1}{4}$	5	.072	1	Camphic	5.00
2	2 $\frac{1}{2}$	5	.088	1 $\frac{1}{4}$	Camphor	5.50
3	2 $\frac{3}{4}$	6 $\frac{3}{4}$	.145	1 $\frac{1}{4}$	Campos	6.00
4	3	6 $\frac{3}{4}$	.171	1 $\frac{1}{2}$	Camwood	6.50
5	3 $\frac{1}{4}$	7 $\frac{1}{4}$	.217	1 $\frac{1}{2}$	Canal	7.50
6	3 $\frac{1}{2}$	7 $\frac{1}{4}$	.250	2	Canard	9.00

To avoid freezing, raise the brake to its extreme height, thus tripping the valves.

Extra prices to adapt any of the above for acids or hot water. (See page 10.)

Special Lift Pumps

LIFT, 25 FEET



FIGS. 17 & 48

FOR MOLASSES OR
HOT WATER

Figure 17 is constructed with metal valves throughout to resist the action of acids, hot water, etc. Use as short a suction-pipe as possible on the latter, for the vapor rising from it destroys the vacuum.

Nos. 00 and 0 have cylinder screwed to base like Fig. 1, with coupling and thread-tube for iron pipe. Nos. 1, 2, and 3 have cylinder bolted to base, and bolted flange coupling for iron pipe, as shown in cut.

Fig. 48 is like Fig. 17, but with brass cylinder, etc., in place of iron, as specified below.

Fig. 190 has glass cylinder, galvanized piston and rod, solid brass valve-seat and iron spout. Both the cylinder and brake can be turned in any direction desired. This pump is frequently used for demonstrations in physics.

To avoid freezing, raise the brake to its extreme height, thus tripping the valves. Fitted for iron pipe with coupling and solder tube unless otherwise ordered.



FIGS. 190 & 195

GLASS, COPPER OR
BRASS CYLINDER

Fig. 195 is like Fig. 190, but with copper or brass cylinder in place of the glass, as ordered.

PRICES, ETC., FIG. 17

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
00	2½	5½	.096	1¼	Calvish	\$12.00
0	3	7	.177	1½	Calx	15.00
1	3½	8½	.293	2	Calyces	17.00
2	4	10½	.474	2½	Calyx	21.00
3	4½	11½	.629	3	Camail	25.00

PRICES, ETC., FIG. 48

No.	All Brass Except Brake and Stand		Flange and Coupling of Iron		All Brass except Brake	
	Cipher	Price	Cipher	Price	Cipher	Price
00	Carnage	\$22.00	Carom	\$18.00		
0	Carnal	23.00	Caroon	22.00		
1	Carnation	35.00	Carotic	26.00	Carpenter	\$50.00
2	Carol	44.00	Carousal	31.00	Carpentry	60.00
3	Carolling	60.00	Carouse	44.00	Carper	80.00

PRICES, ETC., FIGS. 190 & 195

2½-in. Bore, 5-in. Stroke, 1¼-in. Suction Pipe, Gals. per Stroke .088

Glass Cylinder (Fig. 190)		Copper Cylinder (Fig. 195)		Brass Cylinder (Fig. 195)	
Cipher	Price	Cipher	Price	Cipher	Price
Colytic	\$8.00	Comma	\$8.50	Command	\$8.00

Revolving Stand Pitcher Pumps

LIFT, 25 FEET



FIG. 409
SELF-PRIMING

Figure 409 is a recently-patented invention which insures an immediate supply of water at all times. The leathers are always wet, unless the water is drained off to avoid freezing, which can be effected by pushing the brake down as far as it will go and removing the drain plug under the spout. The pump has open spout and close top like Fig. 272 on page 15.

Fitted for iron or lead pipe as ordered.

Fig. 192 has the cylinder lined with porcelain enamel which avoids iron rust and also diminishes the friction. The valve-seat is of solid brass, and the piston and rod of galvanized iron.



FIG. 192
ENAMELLED

To avoid freezing, raise the brake to its extreme height, thus tripping the valves.

Furnished with closed top, when so ordered.

Fitted for iron or lead pipe as ordered.

Extra prices to adapt Fig. 192 for hot water, etc., see page 15.

PRICES, ETC., FIG. 409

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
2	3	4½	.108	1¼	Detest	\$6.75
3	3½	4	.134	1¼	Detected	7.25

PRICES, ETC., FIG. 192

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
1	2½	4½	.079	1	Combed	\$5.00
2	3	4½	.108	1¼	Combine	5.50
3	3½	4	.138	1¼	Combing	6.25
4	4	4½	.204	1½	Combles	7.50
6	5	4½	.332	2½	Comedy	19.00

Revolving Stand Pitcher Pump

LIFT, 25 FEET



FIG. 120
OPEN SPOUT AND TOP

Figure 120 is a very familiar type of suction pump. It is the cheapest article that can be installed on cisterns or shallow wells for lifts of 25 feet or less.

The spout and top are both open, as shown in cut.

Fitted for iron or lead pipe as ordered.

Fig. 249 is similar to Fig. 120, but with brass cylinder below spout, and galvanized piston and rod. The valve-seat is of solid brass. Furnished with closed top like Fig. 272 when so ordered.

Fitted for iron or lead pipe as ordered.



FIG. 249
BRASS CYLINDER
BELOW SPOUT

PRICES, ETC., FIG. 120

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
1	2½	4½	.079	1	Cicerone	\$4.25
2	3	4½	.108	1¼	Cider	4.75
3	3½	4	.138	1½	Cigar	5.25
4	4	4½	.204	1½	Cigarette	6.25
5	4½	4½	.258	2	Cinder	9.50
6	5	5	.332	2½	Cinnamon	17.00

PRICES, ETC., FIG. 249

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
1	2½	4½	.079	1	Corrugate	\$7.00
2	3	4½	.108	1¼	Corrupt	10.00
3	3½	4	.138	1½	Corruptful	12.00
4	4	4½	.204	1½	Corruption	14.00

To avoid freezing, raise the brake to its extreme height, thus tripping valves.

Extra prices to adapt any of the above for acids or hot water, see page

Revolving Stand Pitcher Pumps

LIFT, 25 FEET



FIG. 274
ROUND SPOUT
CLOSE TOP



FIG. 205
ROUND SPOUT
OPEN TOP



FIG. 272
OPEN SPOUT
CLOSE TOP

The closed top pitcher pumps are preferred by some, since they prevent, in a measure, the entrance of foreign matter at the top.

The round spout pump has a hook to hang a pail on, and the water cannot spill over the spout.

To avoid freezing, raise the brake to its extreme height, thus tripping the valves.

PRICES, ETC., FIGS. 274, 205 & 272

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	Cipher Fig. 274	Cipher Fig. 205	Cipher Fig. 272	Price Either Style
1	2½	4½	.079	1	Cranium	Concert	Cradle	\$4. 25
2	3	4½	.108	1¼	Cranky	Concejerge	Craft	4. 75
3	3½	4	.138	1½	Craie	Coneise	Craftily	5. 25
4	4	4½	.204	1½	Crash	Conciseely	Crag	6. 25

Extra net prices to adapt Figs. 120, 190, 192, 195, 205, 272 and 274 for hot water or acids by adding Poppet lower valves and canvas-packed pistons; also approximate weight and number packed in ordinary hogshead.

Size	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Extra for Metal Valves	\$1. 40	\$1. 60	\$1. 90	\$2. 10	\$2. 50	\$3. 00
Weight each	20 lb.	25 lb.	27 lb.	30 lb.	44 lb.	52 lb.
Number in Hogshead	30	24	20	18	13	10

Revolving Stand Seamless Copper Pumps

LIFT, 25 FEET



FIG. 313

Figure 313 has a cylinder of seamless drawn copper, lined with tin. The spout is attached by a strong and neat joint. The brake is of malleable iron with nickeled grip. All interior parts are coated with non-corrosive metal, and the pump is altogether a neat, light and durable article.

To avoid freezing, raise the brake to its extreme height, thus tripping the valves.

Fig. 458 is similar to Fig. 313, with the addition of a seamless copper air-barrel which insures greater ease of action and steadier flow of water



FIG. 458

PRICES, ETC., FIG. 313

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
1	2 1/4	4 1/2	.095	1 1/4 lead	Cube	\$6.12
2	2 3/4	4 1/2	.116	1 1/4 lead	Cubeb	6.50
3	3	4 1/2	.137	1 1/4 lead	Cubhood	6.88

PRICES, ETC., FIG. 458

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diameter Suction Pipe	Cipher	Price
1	2 1/4	4 1/2	.095	1 1/4 lead	Doll	\$8.25
2	2 3/4	4 1/2	.116	1 1/4 lead	Dolly	8.75
3	3	4 1/2	.137	1 1/4 lead	Dolphin	9.25

Any of the above can be supplied with extra long cylinder to suit any depth. A nipple for iron pipe will be fitted to the suction at small additional charge (see page 150).

repairs to Figs. 313 and 458, see page 150.

Lift Pumps

LIFT, 25 FEET



FIG. 151
"SOUTHERN YARD"

Figure 151 has the cylinder in the stock, and is especially adapted for warm climates or locations where there is no danger of freezing. It is of suitable height to stand level with the ground.

To avoid freezing, in cold climates, raise the brake to its extreme height, thus tripping the valves.

The valve-seat is of solid brass, and fitted for iron pipe unless otherwise ordered.

Fig. 164 has seamless drawn-brass cylinder, brass piston, brass valve-seat, and brass ball valves. The spout, rod and valve-chamber are of galvanized iron. The folding tripod increases its portability. All parts are readily accessible for cleansing or repair.



FIG. 164
LIQUID MANURE PUMP

This pump is extensively used in tanneries

The suction is fitted with coupling and tube for two-inch hose unless otherwise ordered.

We can furnish any length of suction-hose with suitable strainer. Prices on application.

PRICES, ETC., FIG. 151

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
1	2½	5¾	.123	1¼	Clatter	\$7.00
2	3¼	6¾	.242	1½	Clause	9.00
3	4	7	.316	2	Claver	11.00

PRICES, ETC., FIG. 164. WITHOUT HOSE

Dimensions	Gallons per Stroke	Cipher	Price
4-inch bore. 8¾-inch stroke	.462	Coaxing	\$25.00

Out-Door Lift Pumps

ANTI-FREEZING

Bolted or Screw Working Cylinder



FIG. 102
CISTERN PUMP STYLE

Figure 102 is a good article for light service. It will draw water 25 feet below the working cylinder, the seat of which is about four feet below the flange, making a total lift of 29 feet. The intermediate pipe and rod can be lengthened to suit wells of any depth, but on heavy lifts we would advise a stouter article with more leverage.

Fig. 103 is similar to Fig. 102, but with the characteristic spout and top of the Pitcher Pump, which is preferred by some.



FIG. 103
PITCHER PUMP STYLE

PRICES, ETC., FIG. 102

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	With 3 Feet Set-Length as shown in cut		Standard or Spout Section only	
					Cipher	Price	Cipher	Price
1	2½	4½	.065	1¼	Cheerily	\$6.00	Chemical	\$4.00
2	2½	6	.105	1¼	Cheering	6.50	Chemist	4.00
3	2¾	6	.129	1¼	Cheerless	7.00	Chemistry	4.00
4	3	6½	.158	1¼	Cheerup	7.50	Chenille	5.00
5	3¼	7¼	.217	1½	Cheese	8.00	Cherish	5.00
6	3½	8	.276	1½	Chemic	9.00	Cherisher	6.00

When ordered less pipe and rod, deduct 50 cents list from complete pump.

PRICES, ETC., FIG. 103

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	With 3 Feet Set-Length as shown in cut		Standard or Spout Section only	
					Cipher	Price	Cipher	Price
1	2½	4½	.079	1¼	Cheroot	\$6.75	Cherubim	\$4.00
2	3	4½	.114	1¼	Cherry	7.75	Cherup	4.00
3	3¼	4½	.153	1¼	Cherub	8.75	Chess	4.00
4	4	4½	.204	1½	Cherubic	9.50	Chessman	4.00

When ordered less pipe and rod, deduct 50 cents list from complete pump.

We can furnish any of the above with all brass, brass tube, or brass-lined working cylinder, when so ordered, at reasonable additional charge.

Yard Lift Pumps

ANTI-FREEZING

Bolted or Screw Working Cylinder

Figure 226 is of suitable height to be worked on a level with the ground and is well adapted for light service. Supplied regularly with three feet of set-length, which, with 25 feet of suction-pipe, would adapt it for 29-foot wells.

The intermediate pipe and rod can be lengthened within the limits prescribed below to suit wells of any depth.

Fig. 226 will operate a 3-inch working cylinder on lifts of not over 35 feet.

Fig. 225 is similar to Fig. 226, but the stand fits closely around the rod, providing a guide for the same and preventing the entrance of leaves or other foreign matter.



FIG. 226
OPEN TOP



FIG. 225
TIGHT TOP

PRICES, ETC., FIG. 226 WITH 3 FEET SET-LENGTH

Bore of Working Cylinder	Gallons per Stroke	Diam. Suction Pipe	No. 0 Standard 44 inches from flange to top of brake; 6 1/4-inch Stroke		No. 1 Standard 48 inches from flange to top of brake; 6 1/4-inch Stroke	
			Cipher	Price	Cipher	Price
2 1/4	.107	1 1/4	Consound	\$8.00	Constant	\$8.50
2 1/2	.110	1 1/4	Conspiracy	8.00	Constantly	8.50
2 3/4	.134	1 1/4	Conspire	8.25	Constate	8.75
3	.138	1 1/4	Constable	8.50	Constrain	9.00
3 1/4	.187	1 1/2	Constance	8.75	Constrict	9.25
3 1/2	.210	1 1/2	Constancy	9.00	Construct	9.50

When ordered less pipe and rod, deduct 50 cents from list.

FIG. 226. STANDARD OR UPPER SECTION ONLY

No. 0 (Consul) . . . \$5.25 No. 1 (Consular) . . . \$5.75

PRICES, ETC., FIG. 225. WITH 3 FEET SET-LENGTH

Bore of Working Cylinder	Gallons per Stroke	Diameter of Suction Pipe	Standard 48 inches tall; Stroke 6 1/4 inches	
			Cipher	Price
2 1/4	.107	1 1/4	Conserve	\$8.25
2 1/2	.110	1 1/4	Consist	8.25
2 3/4	.134	1 1/4	Consolable	8.75
3	.158	1 1/4	Console	9.25
3 1/4	.187	1 1/2	Consonant	9.50
3 1/2	.210	1 1/2	Consort	9.75

When ordered less pipe and rod, deduct 50 cents from list.

Fig. 225, Standard or Upper Section only (Consortion) \$6.00

Yard Lift Pumps

ANTI-FREEZING

Figure 211, "Swan Pump," is a very popular style of yard lift pump for medium service. It will operate a three-inch working cylinder on lifts of 50 feet. The stand will revolve to any point desired. Stand-tapped directly under the spout.

Bolted or screw working cylinder, as ordered.

Fig. 387 is the standard, or upper section only, of Fig. 211. Tapped just under spout for 1¼-inch pipe.

Fig. 325 is similar to Fig. 211, but has a stand which fits closely around the rod, providing a guide for the same and preventing the entrance of leaves and other foreign matter. Fig. 325 Standard is 32 inches tall.

Bolted or screw working cylinder as ordered.



FIG. 211 & FIG. 387
(UPPER SECTION ONLY)



FIG. 325
TIGHT TOP

PRICES, ETC., FIG. 211

WITH 3 FEET WROUGHT IRON SET-LENGTH

Bore of Lower Cylinder	Diam. Suction Pipe	No. 1 Standard 29 inches tall, 5¼-inch Stroke			No. 2 Standard 32 inches tall, 6-inch Stroke		
		Gals. per Stroke	Cipher	Price	Gals. per Stroke	Cipher	Price
2¼	1¼	.077	Conductive	\$7.50	.090	Confederal	\$7.75
2½	1¼	.092	Conductor	7.50	.015	Confer	7.75
2¾	1¼	.113	Cone	8.00	.129	Conference	8.25
3	1½	.133	Confab	8.50	.152	Confess	8.75
3¼	1½	.161	Confect	9.00	.185	Confessed	9.25
3½	1½	.181	Confection	9.50	.207	Confession	9.75
3¾	1½				.240	Confessor	11.00
4	2				.280	Confide	13.00

When ordered without intermediate pipe and rod, deduct 50 cents from list.

PRICES, ETC., FIG. 387

Size	Cipher	Price
No. 1 Standard	Conflict	\$5.00
No. 2 Standard	Confluence	5.50

PRICES, ETC., FIG. 325. WITH 3 FEET SET-LENGTH

Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
2¼	6	.090	1¼	Culminate	\$8.25
2½	6	.105	1¼	Culpable	8.25
2¾	6	.129	1¼	Culpatory	8.75
3	6	.152	1¼	Culprit	9.25
3¼	6	.185	1½	Cultist	9.50
3½	6	.207	1½	Cultivate	9.75

When ordered less pipe and rod, deduct 50 cents from list.

Standard or upper section only, Fig. 325, tapped for 1¼-in. pipe (Cultivated), \$6.00.

Yard Lift Pumps

ANTI-FREEZING

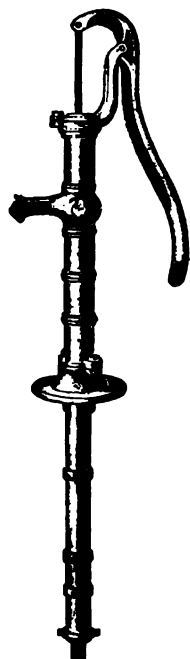


FIG. 215

Figure 215 has cast-iron set-length of somewhat larger diameter than the working cylinder so that the piston can be withdrawn without disturbing the base or suction-pipe. The spout and brake can each be turned in any direction desired. The valve-seat is of solid brass, and located about 32 inches below the flange. Adapted for wells 28 feet deep.

Fitted for iron pipe unless otherwise ordered.

Fig. 2 is similar in construction to Fig. 215, but is somewhat heavier. The flange is screwed to the cylinder instead of bolted. The valve-seat is of solid brass. Adapted for wells 28 feet deep.

Fitted for iron pipe unless otherwise ordered.



FIG. 2

PRICES, ETC., FIG. 215

Size of Standard	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	Cipher	Price
No. 1 Standard, 29 inches high, 35 inches to top of brake	2½	5¼	.092	1¼	Conflux	\$7.50
No. 2 Standard, 32 inches high, 38 inches to top of brake	2½	5¼	.112	1¼	Conformed	8.00
No. 2 Standard	3	5¼	.128	1¼	Confound	8.50
No. 2 Standard with one foot extra set-length	3	5¼	.128	1¼	Confront	10.00

PRICES, ETC. FIG. 2

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diameter Suction Pipe	Cipher	Price
1	2½	5¼	.101	1¼	Cabas	\$9.00
2	3¼	6¼	.202	1½	Cabaset	12.00
3	4	7	.316	2	Cabbage	13.00

Extra lengths of intermediate cylinder, about three feet long, to adapt Fig. 2 for deep wells. Price each, including rod:

No. 1, \$2.75

No. 2, \$3.50

No. 3, \$4.25

Yard Lift Pumps

ANTI-FREEZING

Figure 58 has water-packed piston. An air-barrel and a strainer are combined with the lower cylinder. The pump is regularly supplied as shown for submerged use, but can be fitted for iron or lead suction-pipe when so ordered.

The intermediate pipe and rod can be lengthened to suit wells of any depth up to 40 feet.

Fig. 121 has wrought-iron set-length and bolted or screw working cylinder as ordered. The flange or base is detachable from the upper cylinder. The upper section is the same as Fig. 58, and similar to Fig. 2 on previous page.

Furnished with brace at 50 cents extra list.



FIG. 58



FIG. 121

PRICES, ETC., FIG. 58. NO PIPE OR ROD

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Intermediate Pipe in Inches	Cipher	Price
1	3	6	.152	1 1/4	Carter	\$12.00
2	4	7	.316	1 1/2	Cartilage	18.00
3	4 1/2	7	.400	2	Cartman	24.00

PRICES, ETC., FIG. 121. WITH 3 FEET SET-LENGTH

Size	Diam. Work'g Cyl.	Gals. per Stroke	Diam. Suct'n Pipe	Cipher	Price
No. 1 Standard, 35 inches high, 6-inch stroke. Will operate 3 1/4-inch cylinder on 50-foot lift	2 1/2	.105	1 1/4	Circe	\$8.25
	2 3/4	.105	1 1/4	Cirele	8.50
	3	.152	1 1/4	Circlet	8.75
	3 1/4	.179	1 1/2	Circuit	9.00
No. 2 Standard, 35 inches high, 7-inch stroke. Will operate 3 1/2-inch cylinder on 50-foot lift	3	.180	1 1/4	Circular	10.00
	3 1/4	.209	1 1/2	Circulate	10.50
	3 1/2	.242	1 1/2	Circus	11.00
No. 3 Standard, 36 inches high, 7 1/2-inch stroke. Will operate 4-inch cylinder on 50-foot lift	3 1/2	.259	1 1/4	Citadel	13.00
	4	.388	1 1/2	Citation	13.50
	6	.757	3	Citizen	20.00

When ordered without the intermediate pipe and rod, deduct 50 cents from list.

PRICES, ETC., STANDARD OR UPPER SECTION ONLY, FIG. 121

Size	Height	Fitted for Pipe	Cipher	Price
No. 1	35 inches	1 1/4 inches	Citron	\$5.00
No. 2	35 inches	1 1/2 inches	Civic	8.00
No. 3	36 inches	2 inches	Civil	10.00
No. 1, Tall	48 inches	1 1/4 inches	Civilian	8.00
No. 2, Tall	54 inches	1 1/2 inches	Civilist	10.00

We can furnish any of the above with all brass, brass tube, or brass-lined working cylinder at a reasonable additional charge.

Yard Lift Pump Standards



FIG. 368

Figure 368 is for heavier duty than Fig. 387 on previous page. The standard is cast in two sections with a flange between, which can be altered to suit different sizes of pipe.

Fig. 368 is designed to operate a three-inch working cylinder on lifts of 60 feet.

Tapped for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

Rod fitted for $\frac{1}{4}$ -inch pipe unless otherwise ordered.



FIG. 372

Fig. 372 is designed for extra heavy duty, and will operate a three-inch working cylinder on lifts of 100 feet.

There are two braces, as shown in cut,

and the brake is cushioned with rubber where it strikes the stand.

Tapped just under spout for $1\frac{1}{2}$ -inch pipe, unless otherwise ordered. Can be furnished for any size pipe up to three inches.

Rod fitted for $\frac{1}{2}$ -inch pipe unless otherwise ordered

PRICES, ETC., FIG. 368

Style	Cipher	Price
Standard, as shown in cut.....	Dally	\$9.00
Extra Intermediate Flanges, $1\frac{1}{4}$ -inch .....	.....	.50
Extra Intermediate Flanges, $1\frac{1}{2}$ to $2\frac{1}{2}$ -inch .....	.....	.60

PRICES, ETC., FIG. 372

Style	Cipher	Price
Standard, as shown in cut.....	Damon	\$15.00
Standard, with Air-Barrel in Spout.....	Damouch	20.00

For working cylinders, see pages 51 to 57.

Pump Standards



FIG. 189
LIFT PUMP STANDARD

Figure 189 is for heavy duty and will operate a 3-inch working cylinder on lifts of 75 feet.

The standard is tapped just under the spout for $1\frac{1}{2}$ -inch pipe, but will be fitted for $1\frac{1}{4}$ or 2-inch pipe when so ordered.

When fitted for 3-inch or smaller working cylinder, the rod is threaded for $\frac{1}{4}$ -inch pipe; above 3 inches, the rod is threaded for $\frac{3}{8}$ -inch pipe.



FIG. 206
FORCE PUMP STANDARD

Fig. 206 is similar to Fig. 189, but is a force instead of lift pump. We can furnish Fig. 206 with cock in spout and suitable discharge hose when so ordered, at reasonable additional price.

Top discharge for $1\frac{1}{2}$ -inch pipe.

Side discharge for $1\frac{1}{4}$ -inch hose.

Side discharge (when with cock), $1\frac{1}{2}$ -inch hose.

PRICES, ETC., FIG. 189. 7-INCH STROKE WITH LOWER CYLINDER 16 INCHES LONG, NO PIPE OR ROD

No.	Diam. Work'g Cylinder Inches	Gals. per Stroke	Diam. Suction Pipe Inches	Cipher	Price
1	$2\frac{1}{4}$	.10	$1\frac{1}{4}$	Coltish	\$16.00
2	$2\frac{3}{4}$	.15	$1\frac{1}{4}$	Coltishly	16.00
3	$3\frac{1}{4}$	.21	$1\frac{1}{2}$	Coltsfoot	17.00
4	$3\frac{3}{4}$	.28	$1\frac{1}{2}$	Columbia	18.00

Fig. 189, standard or upper section only, tapped just under spout for $1\frac{1}{2}$ -inch pipe, unless otherwise ordered (Column), \$10.00.

PRICES, ETC., FIG. 206. 6-INCH STROKE WITH LOWER CYLINDER 16 INCHES LONG, NO PIPE OR ROD

No.	Diam. Work'g Cylinder Inches	Gals. per Stroke	Diam. Suction Pipe Inches	Cipher	Price
1	$2\frac{1}{4}$	.086	$1\frac{1}{4}$	Concison	\$19.00
2	$2\frac{3}{4}$	.129	$1\frac{1}{4}$	Concite	19.00
3	$3\frac{1}{4}$	.179	$1\frac{1}{2}$	Conclave	20.00
4	$3\frac{3}{4}$	.239	$1\frac{1}{2}$	Conclude	21.00

Fig. 206, standard or upper section only, tapped just under spout for $1\frac{1}{2}$ -inch pipe, unless otherwise ordered (Conclusion), \$13.00.

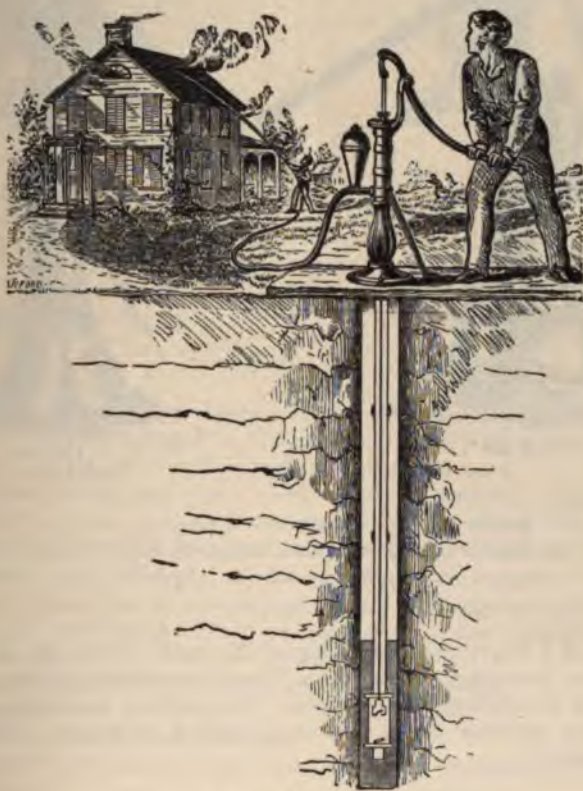


FIG. 206 IN OPERATION

(FIG. 227)

SHOWING A COMMON METHOD OF SETTING DEEP WELL PUMPS

Yard Force Pump Standards



FIG. 310

FIG. 364
"CAPITAL CITY" PUMP

Figure 310 is similar to Fig. 206, shown on page 24, with the substitution of wood bars for the regular style brake, thus adapting it for two men.

Fig. 310 is tapped just under spout for $1\frac{1}{2}$ -inch pipe, unless otherwise ordered.

Fig. 364 is a heavy standard designed for public wells. It can be used as a lift pump by loosening the top plug. The rocker-shaft is of drop-forged steel and the brake is of heavy wrought iron. The pump is regularly supplied with 6-inch working cylinder and 3 feet of galvanized set-length; discharge fitted for 2-inch hose.

PRICES, ETC., FIG. 310. STANDARD ONLY

Style	Cipher	Price
As shown in cut, with Wood Bars and two Braces.....	Cub	\$21.00
With single Wrought-Iron Brake	Cuban	20.00

PRICE, ETC., FIG. 364

Complete, as specified above (Cyst) \$50.00

For suitable working cylinders, see pages 51 to 57.

Yard Force Pump Standards



FIG. 388



FIG. 389

Figure 388 is a force pump standard for medium service, and is designed to operate a 3-inch working cylinder on lifts of 60 feet. The base is detachable. Tapped at base for $1\frac{1}{4}$ -inch pipe, unless otherwise ordered.

Rod threaded for $\frac{1}{4}$ -inch pipe; when used with working cylinders, 3-inch diameter or less.

Side discharge fitted for 1-inch hose; top discharge, $1\frac{1}{4}$ -inch iron pipe.

Fig. 389 is constructed in two sections, with pipe flange between, which can be fitted for any size pipe from $1\frac{1}{4}$ to $2\frac{1}{2}$ -inch. Unless otherwise ordered, $1\frac{1}{4}$ -inch will be sent.

Fig. 389 will operate a 3-inch cylinder on lifts of 60 feet.

Side discharge for 1-inch hose.

Top discharge for $1\frac{1}{4}$ -inch iron pipe.

Rod threaded for $\frac{1}{4}$ -inch pipe when used with working cylinders 3-inch diameter or less.

PRICES, ETC., FIGS. 388 & 389

Style		Cipher	Price
Fig. 388	As shown in cut.....	Deftness	\$ 9.00
	With Cock in Discharge.....	Defuse	11.50
Fig. 389	As shown in cut.....	Degrade	12.00
	With Cock in Discharge.....	Degrading	14.00

For working cylinders, see pages 51 to 57.

Yard Force Pumps



FIG. 152
FOR WARM CLIMATES

Figure 152 has the working cylinder combined in the stock of the pump, and is best adapted for locations where there is no danger of freezing. To avoid freezing in cold climates, raise the brake to its extreme height, thus tripping the valves. The valve-seat is solid brass and fitted for iron pipe, unless otherwise ordered. Adapted for wells not over 25 feet deep.

Fig. 228 is in general use for medium service. It will operate a 3-inch cylinder on lifts of 60 feet. As listed, this pump is adapted for wells about 29 feet deep. Supplied with bolted or screw working cylinder, as ordered. This pump is anti-freezing, and is one of the best-known and most popular yard force pumps now on the market.



FIG. 228
ANTI-FREEZING

PRICES, ETC., FIG. 152

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suction Pipe	Cipher	Price
1	2½	5	.088	1¼	Claw	\$12.00
2	3¼	7	.242	1½	Clawback	18.00

PRICES, ETC., FIG. 228. WITH 3 FEET SET-LENGTH

Diameter Working Cylinder	Diameter Suction Pipe	Discharge	No. 1 Standard			No. 2 Standard		
			Gals. per Stroke	51 inches to top of brake 5-inch Stroke		Gals. per Stroke	55 inches to top of brake 7-inch Stroke	
				Cipher	Price		Cipher	Price
2½	1¼	1-in. Hose	.088	Consulship	\$13.00	.....	.....	.....
2½	1¼	on No. 1	.107	Consult	13.00	.....	.....	.....
3	1¼	Standard	.127	Consulter	13.00	.177	Contagion	\$17.75
3¼	1½	1¼-in. Hose	.150	Consulting	13.50	.210	Contagious	18.00
3½	1½	on No. 2	.173	Consummate	14.50	.242	Contemple	19.00
4	2	Standard	.....	.....	.....	.316	Contempt	20.50

When ordered less pipe, deduct 50 cents from list.

PRICES, ETC., FIG. 228, STANDARD OR UPPER SECTION ONLY

Size	Diameter Pipe	Tapped	Cipher	Price
No. 1	1¼-inch	Under Spout	Contention	\$10.25
No. 2	1½-inch	At Base	Contently	14.50

For suitable working cylinders, see pages 51 to 57.

Yard Force Pumps

ANTI-FREEZING



FIG. 122

Figure 122 is similar to Fig. 228, on previous page, but the set-length is of cast iron, a little larger than the working cylinder, so that the piston can be withdrawn without disturbing the suction-pipe. The upper cylinder is detachable at the base, and the valve-seat is of solid brass. Adapted for wells 28 feet deep. Fitted for iron pipe unless otherwise ordered.

Fig. 297 is for medium service. It will operate a 3-inch working cylinder on lifts of 60 feet. The upper cylinder is secured to the base by loose ears, allowing the spout to be turned in any direction. Bolted or screw working cylinder furnished as ordered. The standard measures 44 inches from base to top of brake. Fig. 246, on page 40, shows the same pump adapted for windmill use.



FIG. 297

PRICES, Etc., FIG. 122

VALVE-SEAT 32 INCHES BELOW FLANGE

Number	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	Discharge Fitted for	Cipher	Price
1, 51 inches high	2½	5	.088	1¼	1 -in. hose	Civility	\$13.00
2, 55 inches high	3¼	7	.210	1½	1¾-in. hose	Civilize	17.75

PRICES, Etc., FIG. 297. WITH 3 FEET SET-LENGTH, 6-INCH STROKE

Bore Inches	Gals. per Stroke	Diam. Suct'n Pipe	Side Discharge	Top Discharge	Cipher	Price
2¼	.129	1¼	1-inch hose	1¼-inch pipe	Croquet	\$14.75
3	.152	1¼	1-inch hose	1¼-inch pipe	Cross	15.00
3¼	.189	1½	1-inch hose	1¼-inch pipe	Crossbill	15.50
3½	.207	1½	1-inch hose	1¼-inch pipe	Crossbone	16.00

Yard Force Pumps

ANTI-FREEZING



FIG. 207

Figure 207 will operate a 3-inch working cylinder on lifts of 60 feet. The upper cylinder is detachable from the base. Bolted or screw working cylinder furnished as ordered.

Standard, 47 inches high to top of brake.

Side discharge, 1¼-inch hose.

Top discharge, 1½-inch pipe.

Stroke, 7 inches.



FIG. 62

Fig. 62 is similar to Fig. 207, but with cast-iron set-length a little larger than the working cylinder so that the piston can be withdrawn without disturbing the standard. The valve-seat is of solid brass. Standard, 47 inches from flange to top of brake. Valve-seat, 32 inches below flange. Suitable for 28-foot wells. Fitted for 1½-inch iron pipe, unless otherwise ordered.

Side discharge, 1¼-inch hose.

Top discharge, 1½-inch iron pipe.

Bore, 3¼ inches; stroke, 7 inches.

PRICES, ETC., FIG. 207. WITH 3 FEET SET-LENGTH

Diameter Working Cylinder	Gallons per Stroke	Diameter Suction Pipe	Cipher	Price
3 -inch	.200	1¼-inch	Concocter	\$15.75
3½-inch	.250	1½-inch	Concord	16.75
3¾-inch	.300	1½-inch	Concordly	17.25
4 -inch	.350	2 -inch	Concourse	18.25

Standard or upper section only, Fig. 207, tapped at base for 1½-inch pipe unless otherwise ordered.....(Concrete.....\$13.00

PRICE, ETC., FIG. 62

As shown in cut(Castanet).....\$18.00

Yard Force Pumps

ANTI-FREEZING

Figure 454 has all working parts so constructed that they can be lifted out for repairs by loosening four cap screws in the base. The piston interlocks with the lower valve by giving the rod a partial turn to the left. Regular length of set, $5\frac{1}{2}$ feet from flange to bottom, adapting it for wells 30 feet deep. The pipes and rod can be lengthened to suit lifts of 40 feet. Fitted for $1\frac{1}{4}$ -inch iron pipe suction and 1-inch hose discharge.

Fig. 300 is designed to operate a 3-inch working cylinder on wells of 80 feet or equivalent lift to point of discharge. The rocker-shaft is of cast steel, and the wood bar, which is removable, provides a long leverage. Furnished with bolted or screw working cylinder as ordered. Discharge fitted for 1-inch hose.



FIG. 454
"BLUE JACKET"



FIG. 300
"INTERNATIONAL"

PRICES, ETC., FIG. 454
3-INCH BORE, 6-INCH STROKE
CAPACITY .184 GALLONS PER STROKE

As shown in Cut		With 3-Way Cock		With Windmill Head Less Cock		With Windmill Head and with Cock	
Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
Dogma	\$15.00	Dogmatic	\$17.00	Dogstar	\$17.00	Dogstone	\$19.00

PRICES, ETC., FIG. 300. 6-INCH STROKE. WITH 3 FEET SET-LENGTH

Diameter Working Cylinder	Gallons per Stroke	Diameter Suction Pipe	As Shown in Cut		With Cock in Spout	
			Cipher	Price	Cipher	Price
$2\frac{3}{4}$ -inch	.154	$1\frac{1}{4}$ -inch	Crosspatch	\$20.00	Crotchot	\$22.00
3 -inch	.184	$1\frac{1}{2}$ -inch	Crossroad	20.50	Croton	22.50
$3\frac{1}{4}$ -inch	.215	$1\frac{3}{4}$ -inch	Crosswise	21.00	Crotonic	23.00

STANDARD OR UPPER SECTION ONLY, FIG. 300

Style	Cipher	Price
Trapped for $1\frac{1}{4}$ -inch pipe, unless otherwise ordered	Crotal	\$15.00
Same, with cock in spout	Crouchback	17.00

Fig. 300 will be supplied with brass, brass-lined or brass tube working sections, when so ordered, at reasonable additional charge.



FIG. 186

Yard Force Pumps

ANTI-FREEZING

Figure 186 is adapted for 30-foot wells or equivalent elevation to point of discharge. It will give excellent satisfaction for light service.

Furnished with bolted or screw working cylinder as ordered.

Suction fitted for $1\frac{1}{4}$ -inch iron pipe.

Side discharge fitted for 1-inch hose.

Fig. 180 is Fig. 186 less cock in spout. Suction for $1\frac{1}{4}$ -inch iron pipe. Side discharge, $1\frac{1}{4}$ -inch hose.

Fig. 210 is adapted for wells of 30 feet or equivalent elevation to point of discharge. The rocker-shaft is of drop-forged steel. Furnished with bolted or screw working cylinder as ordered. Both the top and the side discharge are fitted for 1-inch hose, or, by removing the nipple, for 1-inch iron pipe.



FIG. 210

PRICES, ETC., FIGS. 186 & 180. 5-IN. STROKE. WITH 3 FEET SET-LENGTH

No.	Bore Inches	Gals. per Stroke	As Shown in Cut—Fig. 186		Less Cock in Spout—Fig. 180	
			Cipher	Price	Cipher	Price
2	$2\frac{1}{2}$	.088	Colleague	\$14.50	Coinless	\$14.00
3	$2\frac{3}{4}$	.107	Collection	15.00	Coinsure	14.50
4	3	.127	College	15.50	Cojoin	15.00

When ordered less pipe, deduct 50 cents from list.

STANDARD OR UPPER SECTION ONLY, FIG. 186

Size	Cipher	Price
No. 2, for $1\frac{1}{4}$ -inch Pipe.....	Collegian	\$10.50
No. 3, for $1\frac{1}{4}$ -inch Pipe.....	Collide	10.50
No. 4, for $1\frac{1}{2}$ -inch Pipe.....	Collier	11.00

PRICES, ETC., FIG. 210. 6-IN. STROKE. WITH 3 FEET SET-LENGTH

Diam. Working Cylinder	Gals. per Stroke	Diam. Suction Pipe	As Shown in Cut		With Cock in Spout—Like Fig. 244	
			Cipher	Price	Cipher	Price
$2\frac{1}{2}$	.128	$1\frac{1}{4}$	Condole	\$15.00	Faba	\$17.50
$2\frac{3}{4}$	.154	$1\frac{1}{4}$	Condolence	15.25	Fabaceous	17.75
3	.184	$1\frac{1}{4}$	Condome	15.50	Fabella	18.00
$3\frac{1}{4}$	.215	$1\frac{1}{2}$	Conduce	16.00	Fabian	18.50

When ordered less pipe, deduct 50 cents from list.

Standard or Upper Section only, tapped for $1\frac{1}{4}$ -inch pipe (Conduct), \$10.00.

Any of the above furnished with brass, brass tube or brass-lined cylinders when so ordered, at small additional charge.

Yard Force Pumps

ANTI-FREEZING

Figure 235 will operate a 3-inch working cylinder on wells 75 feet deep, or equivalent elevation to point of discharge. The Standard measures 28 inches to under side of spout; 51 inches over all. The rocker-shaft is of drop-forged steel. By loosening the top plug the pump is adapted for lifting only. Both top and side discharge are fitted for 1-inch hose, or, by removing the nipple, for 1-inch iron pipe. Fig. 235, with cock, has top and side discharge for 1-inch hose.

Fig. 331, as shown in cut, is adapted for wells 30 feet deep, with extreme lift of 50 feet to point of discharge. A differential plunger renders the pump double-acting. The working cylinder is porcelain lined, and the air-chamber combined with same increases the ease of operation and steadiness of flow. The 3-inch size has $1\frac{1}{4}$ -inch suction; discharge fitted for 1-inch hose. The $3\frac{1}{2}$ -inch size has $1\frac{1}{2}$ -inch suction; discharge fitted for $1\frac{1}{4}$ -inch hose.



FIG. 235
"PENDULUM YARD"



FIG. 331
"ECONOMIC"

PRICES, ETC., FIG. 235. 4 1-2-IN. STROKE. WITH 3 FEET SET-LENGTH

Diam. Working Cylinder	Gals. per Stroke	Diam. Suction Pipe	Figure 235 As Shown in Cut		Figure 235 With Cock in Spout	
			Cipher	Price	Cipher	Price
$2\frac{3}{4}$	.114	$1\frac{1}{4}$	Convenable	\$17.50	Conventual	\$21.00
3	.137	$1\frac{1}{4}$	Convence	18.00	Convergent	21.50
$3\frac{1}{4}$	.162	$1\frac{1}{2}$	Convent	18.50	Converging	22.00

When ordered less pipe, deduct 50 cents from list.

PRICES, ETC., FIG. 235. STANDARD OR UPPER SECTION ONLY

Style	Cipher	Price
As shown in cut, for $1\frac{1}{2}$ -inch Inlet.....	Converge	\$14.00
With Cock in Spout, for $1\frac{1}{2}$ -inch Inlet.....	Conversant	17.50

PRICES, ETC., FIG. 331. FOR WELLS NOT OVER 30 FEET DEEP

Diameter Working Cylinder	Stroke	Gals. per Stroke	Cipher	Price
3 inches (With Cock)	6-inch	.184	Cup	\$18.00
3 inches (Less Cock)	6-inch	.184	Cupful	16.00
$3\frac{1}{2}$ inches (With Cock)	6-inch	.250	Cupboard	22.00
$3\frac{1}{2}$ inches (Less Cock)	6-inch	.250	Cupid	20.00

Fig. 331 can be furnished with longer pipe and rod when so ordered.

Yard Force Pumps

ANTI-FREEZING DOUBLE-ACTING



FIG. 352
FOR DEEP WELLS



Figure 352 is similar to Fig. 331 on previous page, but has separate working cylinder which can be adjusted at suitable depth for wells of 60 feet or less. We furnish this regularly with screw working cylinder. A suction basket is sent with every pump. Fitted regularly with 3-way cock for underground discharge.

Fig. 377 is for wells not over 30 feet deep. It is arranged with wood bars for two men, as shown in cut. Dimensions and fittings like Fig. 331 on previous page.

Fig. 377 can be arranged for deeper wells when so ordered.



FIG. 377
FOR SHALLOW WELLS

PRICES, ETC., FIGS. 352 & 377. WITH COCK, AS SHOWN IN CUT

Diameter Working Cylinder	Stroke	Gals. per Stroke	Suction for Pipe	Discharge for Hose	Rod for Pipe	Cipher	Price
Fig. 352 3 inches	6-inch	.184	1 1/4-inch	1 -inch	1/4-inch	Cutlery Cutlet	\$20.00
3 1/2 inches	6-inch	.250	1 1/2-inch	1 1/4-inch	1/2-inch		24.00
Fig. 377 3 inches	6-inch	.184	1 1/4-inch	1 -inch	.....	Dazzle Dazzling	25.00
3 1/2 inches	6-inch	.250	1 1/2-inch	1 1/4-inch	.....		30.00

PRICES, ETC., FIGS. 352 & 377. WITHOUT 3-WAY COCK

Diameter Working Cylinder	Stroke	Gals. per Stroke	Suction for Pipe	Discharge for Hose	Rod for Pipe	Cipher	Price
Fig. 352 3 inches	6-inch	.184	1 1/4-inch	1 -inch	1/4-inch	Cutting Cuttle	\$18.00
3 1/2 inches	6-inch	.250	1 1/2-inch	1 1/4-inch	1/2-inch		22.00
Fig. 377 3 inches	6-inch	.184	1 1/4-inch	1 -inch	.....	Deadly Deaf	23.00
3 1/2 inches	6-inch	.250	1 1/2-inch	1 1/4-inch	.....		28.00

Windmill Force Pumps

ANTI-FREEZING DOUBLE-ACTING

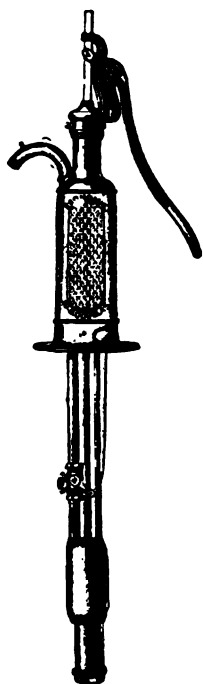


FIG. 353
FOR SHALLOW WELLS

Figure 353 is for wells of 30 feet or less, with an extreme lift, for hand use, of 50 feet to the point of discharge. Arranged for hand or windmill power as shown.

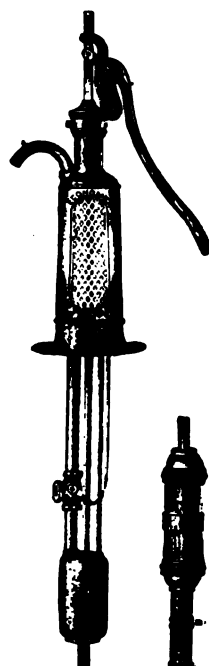


FIG. 419
FOR DEEP WELLS

Fig. 419 is for deep wells, and can be used with hand power on lifts of 60 feet from water to point of discharge.

PRICES, ETC., FIGS. 353 & 419. WITH COCK, AS SHOWN IN CUT

Diameter Working Cylinder	Stroke	Gals. per Stroke	Suction for Pipe	Discharge for Hose	Rod for Pipe	Cipher	Price
Fig. 353							
3 inches	6-inch	.184	1¼-inch	1 -inch	.....	Cutworm	\$20.00
3½ inches	6-inch	.250	1½-inch	1¼-inch	.....	Cuvieria	24.00
Fig. 419							
3 inches	6-inch	.184	1¼-inch	1 -inch	¼-inch	Cutwater	22.00
3½ inches	6-inch	.250	1½-inch	1¼-inch	½-inch	Cycle	26.00

PRICES, ETC., FIGS. 353 & 419. WITHOUT 3-WAY COCK

Diameter Working Cylinder	Stroke	Gals. per Stroke	Suction for Pipe	Discharge for Hose	Rod for Pipe	Cipher	Price
Fig. 353							
3 inches	6-inch	.184	1¼-inch	1 -inch	.....	Cuvette	\$18.00
3½ inches	6-inch	.250	1½-inch	1¼-inch	.....	Cwmry	22.00
Fig. 419							
3 inches	6-inch	.184	1¼-inch	1 -inch	¼-inch	Cutweed	20.00
3½ inches	6-inch	.250	1½-inch	1¼-inch	½-inch	Cyclist	24.00

Windmill Lift Pump Standards

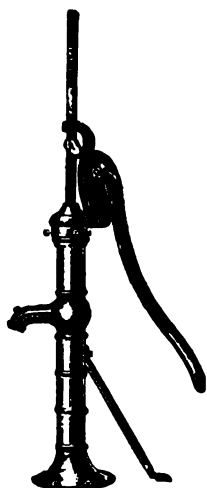


FIG. 219



FIG. 294

Figure 219 will operate a 3-inch working cylinder on wells 50 feet deep. The base is secured to cylinder by two bolts passing through loose ears.

Tapped at base for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

Stroke, $6\frac{1}{2}$ inches.

Fig. 294 is somewhat heavier than Fig. 219, and will operate a 3-inch working cylinder on wells 60 feet deep.

Tapped just under spout for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

PRICES, ETC., FIG. 219

Style	Cipher	Price
Regular Standard	Conject	\$7.25
Standard, 48 inches high	Conjector	8.00

PRICE, ETC., FIG. 294

Standard, as shown in cut (Crone) \$12.00

Suitable working cylinders for Figs. 219 and 294 shown on pages 51 to 57.

Windmill Pump Standards



FIG. 369
LIFT PUMP



FIG. 371
FORCE PUMP

Figure 369 is a lift pump standard which will operate a 3-inch working cylinder on wells 60 feet deep. The standard is cast in sections with removable flange between to adapt it for any size pipe from $1\frac{1}{4}$ to $2\frac{1}{2}$ -inch. Fitted for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

Rod threaded for $\frac{1}{4}$ -inch pipe.

Fig. 371 is a force pump standard for wells 60 feet deep, or equivalent elevation to point of discharge.

Fig. 371 has the intermediate flange like Fig. 396.

Inlet fitted for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

Top discharge for $1\frac{1}{4}$ -inch pipe. Side discharge for 1-inch hose.

PRICES, ETC., FIGS. 369 & 371. 6-INCH STROKE

Style	Cipher	Price
Fig. 369 — Standard, as in cut	Damascus	\$10.00
Fig. 371 — Standard, as in cut	Damask	13.50
Fig. 371 — Standard, with Cock in Spout	Dame	15.50

Extra Intermediate Flanges, $1\frac{1}{4}$ -inch, each \$0.50

Extra Intermediate Flanges, $1\frac{1}{2}$, 2, and $2\frac{1}{2}$ inches60

Suitable working cylinders for Figs. 369 and 371, shown on pages 51 to 57.

Windmill Force Pump Standards



FIG. 314



FIG. 408

Figure 314 is the upper section of Fig. 228 (page 28), with the addition of rod for windmill. Adapted for 3-inch cylinder on lifts of 60 feet from water to point of discharge.

Fig. 408 is similar to Fig. 314, but has cock in spout for 1-inch hose, and outlet in the rear tapped for $1\frac{1}{4}$ -inch pipe.

Inlet tapped just under spout for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

PRICES, ETC., FIGS. 314 & 408

Style	Cipher	Price
Fig. 314, No. 1 Standard—5-inch Stroke, tapped just under spout for $1\frac{1}{4}$ -inch pipe	Cubic	\$12.00
Fig. 314, No. 2 Standard—7-inch Stroke, tapped at base for 2-inch pipe	Cubical	16.00
Fig. 408, No. 1 Standard	Despise	14.50

Suitable working cylinders shown on pages 51 to 57.

Windmill Force Pump Standards



FIG. 322

FIG. 322
WITH COCK

Figure 322 is a somewhat shorter standard than Fig. 314 on previous page, but it is about 15 pounds heavier and adapted for 3-inch cylinder on lifts of 65 feet from water to point of discharge.

Tapped just under spout for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

Back outlet for $1\frac{1}{4}$ -inch pipe.

Front outlet for 1-inch hose.

The discharge-pipe and check-valve are inserted in illustrations merely to show the method of connecting up.

PRICES, ETC., FIG. 322. 5-IN. STROKE

Style	Cipher	Price
Without Cock in Spout	Cudgel	\$12.00
With Cock in Spout	Cudgeler	14.00

Suitable working cylinders shown on pages 51 to 57.

Windmill Force Pump Standards



FIG. 246



FIG. 407

Figure 246 is adapted for 3-inch cylinder on lifts of 65 feet. The cylinder is secured to the base by two bolts passing through loose ears.

Tapped at base for $1\frac{1}{4}$ -inch pipe unless otherwise ordered.

Top discharge, $1\frac{1}{4}$ -inch pipe. Side discharge, 1-inch hose.

Rod, $\frac{1}{4}$ -inch pipe.

Fig. 407 is adapted for 3-inch cylinder on lifts of 75 feet to point of discharge. There is a check-valve under the air-barrel, and the rod is brass covered. A removable pipe flange at the base is fitted regularly for $1\frac{1}{2}$ -inch pipe, but will be furnished for $1\frac{1}{4}$, 2, or $2\frac{1}{2}$ -inch when so ordered.

Top discharge, $1\frac{1}{2}$ -inch pipe. Side discharge, 1-inch hose.

Rod, $\frac{3}{8}$ -inch pipe.

PRICES, ETC., FIG. 246

Style	Cipher	Price
Standard, as shown in cut	Corporal	\$13.00
Same, with Cock in Spout	Corporate	15.50

PRICES, ETC., FIG. 407

Stroke	Cipher	Price
6-inch	Desperate	\$16.00
12-inch	Despight	18.00

Suitable working cylinders shown on pages 51 to 57.

Windmill Pump Standards



FIG. 270
LIFT PUMP STANDARD



FIG. 271
FORCE PUMP STANDARD

Figure 270 is a lift pump standard for heavy duty. It is adapted for a $\frac{3}{4}$ -inch cylinder on wells 75 feet deep.

Tapped just under spout for $1\frac{1}{2}$ -inch pipe unless otherwise ordered. Can be fitted for $1\frac{1}{4}$ or 2-inch when necessary.

Rod threaded for $\frac{3}{8}$ -inch gas pipe.

Fig. 271 is similar to Fig. 270, but with stuffing-box and air-barrel to make it a force pump. Adapted for $\frac{3}{4}$ -inch working cylinder on lifts of 75 feet from water to point of discharge.

Tapped under spout for $1\frac{1}{2}$ -inch pipe unless otherwise ordered.

Top discharge for $1\frac{1}{2}$ -inch pipe.

Side discharge for $1\frac{1}{4}$ -inch hose.

Side discharge (when with cock), $1\frac{1}{2}$ -inch hose.

PRICES, ETC., FIGS. 270 & 271

Style	Stroke	Cipher	Price
Figure 270	$6\frac{1}{2}$ -inch	Cracker	\$12.00
	12 -inch	Crackling	14.00
Figure 271	$6\frac{1}{2}$ -inch	Crackling	15.00
	12 -inch	Crackling	17.00

Suitable working cylinders shown on pages 51 to 57.

Windmill Force Pumps

SELF-PRIMING



FIG. 281
FOR POWER ONLY



FIG. 281
SECTIONAL VIEW



FIG. 367
FOR HAND OR POWER

The sectional cut of Fig. 281 shows how the inside, or working cylinder, is surrounded by water so that the leathers can not become dry. A hand hole at base allows the valve-seat and lower valve to be removed for repairs. The plunger can be withdrawn after loosening the bolts in the divided air-barrel, without disturbing the pipes. The piston and rod, inside cylinder and valve-seat, are of solid brass. There is a check-valve with brass seat in the discharge, also suitable drain plugs to avoid freezing. Adapted for 100-foot lift from water to point of discharge. Extreme depth of suction-pipe, 25 feet.

Fig. 367 is Fig. 281 arranged for either hand or windmill use.

PRICES, ETC., FIG. 281

Bore of Inside Cylinder, Ins.	Diam. Suction Pipe, Inches	Diam. Discharge Pipe, Inches	8-Inch Stroke			10-Inch Stroke			12-Inch Stroke		
			Gals. per Stroke	Cipher	Price	Gals. per Stroke	Cipher	Price	Gals. per Stroke	Cipher	Price
2	1½	1½	.11	Cresylic	\$25.00	.14	Cretic	\$27.50	.25	Cribble	\$30.00
2½	1½	1½	.17	Cretaceal	25.00	.21	Cretonne	27.50	.37	Cribella	32.50
3	1½	1½	.24	Cretaceous	27.50	.30	Crevasse	30.00	.50	Cribellum	40.00
3½	2	2	.....	.....	.....	.42	Crevice	37.50	.....	.....	.....
4	2	2	.....	.....	.....	.54	Crew	42.50	.65	Cribrate	45.00
4½	2½	2½	.....	.....	.....	.69	Crewel	52.50	.83	Cribration	55.00
5	2½	2½	.....	.....	.....	.85	Crib	62.50	1.02	Cribriform	65.00
5½	3	3	.....	.....	.....	1.02	Cribbage	70.00	1.23	Cribrose	72.50
6	3	3	.....	.....	.....	1.22	Cribber	82.50	1.47	Cricetine	85.00

PRICES, ETC., FIG. 367

Bore of Inside Cylinder	Stroke	Diameter Suction Pipe	Diameter Discharge Pipe	Cipher	Price
2 -inch	5-inch	1¼-inch	1¼-inch	Dado	\$27.00
2½-inch	5-inch	1¼-inch	1¼-inch	Daffy	28.50
3 -inch	5-inch	1½-inch	1½-inch	Daft	31.00
3½-inch	5-inch	2 -inch	1½-inch	Daftly	37.50
4 -inch	6-inch	2 -inch	2 -inch	Daftness	45.00
4½-inch	6-inch	2½-inch	2 -inch	Dain	55.00
5 -inch	6-inch	2½-inch	2 -inch	Dainty	65.00

Windmill Force Pumps

SELF-PRIMING



FIG. 429
FOR POWER ONLY



FIG. 433
FOR HAND OR POWER

Figure 429 is an adaptation of the self-priming principle shown in Fig. 281 on previous page. The lower valve can be repaired through the hand hole at bottom, and the plunger can be withdrawn by loosening the bolts in the head without disturbing the suction or discharge-pipe.

The cylinder is brass lined and has $2\frac{1}{2}$ -inch bore, 6-inch stroke. Suction and discharge fitted for $1\frac{1}{4}$ -inch pipe; capacity, .128 gals. per stroke.

Fig. 433 is Fig. 429 arranged with brake and rod for hand or windmill use.

PRICES, ETC., FIGS. 429 & 433

Style	Cipher	Price
Fig. 429.....	Disbind	\$25.00
Fig. 433.....	Discover	28.50

Windmill Force Pumps



FIG. 382

Figure 382 is constructed to stand rough usage, and is adapted for lifts of 60 feet from water to point of discharge. Twenty-five feet of vertical suction-pipe may be used. The rod and stuffing-box are of solid brass. There is a check-valve on the discharge provided with suitable drain plug.

To avoid freezing, the rod should be disconnected from the windmill and lowered, so as to trip the valves, and the drain plug loosened in the spout.

Fig. 383 is same as Fig. 382, but with side ears in place of base, as shown in cut.

No. 2, Figs. 382 and 383, has 1½-inch suction, and top discharge; side discharge for 1-inch hose.

No. 4 has 1½-inch suction, and top discharge; side discharge for 1-inch hose.

No. 6 has 2-inch suction, and top discharge; side discharge for 1½-inch hose.

No. 8 has 2-inch suction, and top discharge; side discharge for 2-inch hose.

When ordered less cock, deduct \$1.50 from list.

When ordered less air-barrel and cock, deduct \$3.50 from list.



FIG. 383

PRICES, Etc., FIG. 382

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Iron		Brass Cylinder Below Spout		All Brass Cylinder	
				Cipher	Price	Cipher	Price	Cipher	Price
2	2½	6½	.138	Decorate	\$14. 50	Decree	\$20. 00	Dedicate	\$25. 50
2	2½	8	.170	Fabular	23. 00	Facial	30. 00	Facula	37. 00
2	2½	12	.255	Fabulate	27. 00	Facient	40. 00	Faculty	50. 00
4	3	6½	.199	Decoration	16. 50	Decrepit	21. 50	Deed	37. 50
4	3	8	.245	Fabulize	25. 00	Faetious	35. 00	Facund	45. 00
4	3	12	.367	Fabulous	30. 00	Faetiously	45. 00	Facundity	60. 00
6	3½	6½	.271	Decorative	24. 00	Decrown	32. 00	Deem	46. 00
6	3½	8	.333	Facade	30. 00	Factive	41. 50	Fad	57. 00
6	3½	12	.500	Facer	42. 00	Factorial	60. 00	Fadaise	78. 00
8	4	8	.435	Decorms	25. 50	Decurve	.....	Deeply	55. 50
8	4	12	.653	Facetious	52. 00	Factual	.....	Faddish	98. 00

PRICES, Etc., FIG. 383

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Iron		Brass Cylinder Below Spout		All Brass Cylinder	
				Cipher	Price	Cipher	Price	Cipher	Price
2	2½	6½	.138	Deface	\$14. 50	Defend	\$20. 00	Deference	\$25. 50
4	3	6½	.199	Defamed	16. 50	Defendant	21. 50	Deferment	37. 50
4	3	8	.271	Defaming	24. 00	Defender	32. 00	Defiable	46. 00
8	4	8	.435	Defeat	25. 50	Defensive	.....	Defiance	55. 50

Windmill Force Pumps

ON PLANK

Figure 283 is a single-acting force pump for hand or windmill use, and is mounted on a grained plank for securing to a wall or post.

Adapted for elevations of 40 feet from water to point of discharge.

Extreme depth of suction-pipe, 25 feet.

Fig. 286 is a double-acting force pump for hand or windmill use, and is mounted on a grained plank for securing to a wall or post.

Adapted for elevations of 40 feet from water to point of discharge.

Extreme depth of suction-pipe, 25 feet.



FIG. 283
SINGLE-ACTING



FIG. 286
DOUBLE-ACTING

PRICES, ETC., FIG. 283

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Pipe	Iron As in Cut		Brass Cylinder Below Spout		All Brass except Brake, Stand and Air-Barrel	
					Cipher	Price	Cipher	Price	Cipher	Price
2	2½	5	.106	1½	Fag	\$13.00	Fagus	\$18.50	Fahlunite	\$25.00
3	2½	5½	.132	1½	Faggot	14.00	Fabam	20.00	Fahr	31.00
4	3	5½	.160	1½	Faggy	15.00	Fahlband	21.50	Faience	36.00
6	3½	5½	.228	2	Fagotto	22.00	Fahlery	30.00	Faik	43.00

Furnished with cock on the discharge, when so ordered, at slight additional cost.

PRICES, ETC., FIG. 286

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Pipe	As Shown in Cut		Without Air-Barrel and Cock	
					Cipher	Price	Cipher	Price
2	2½	5	.212	1½	Cringe	\$22.50	Falerno	\$19.00
3	2¾	5½	.282	1½	Cringer	24.50	Faliscan	21.00
4	3	6½	.397	1½	Cringle	27.50	Fallacy	23.00
6	3½	7	.583	2	Crinite	33.50	Fallible	27.50

Windmill Force Pumps

DOUBLE-ACTING



FIG. 319



FIG. 320

Figure 319 is a very compact form of double-acting windmill force pump. The valves are all under the bonnet shown in front, which can be removed for repairs without disturbing the pipes. The pump is provided with suitable drain plugs, which should be unscrewed and the piston raised to the highest point when in danger of freezing. The rod is of drawn steel. The brake can be turned in any direction desired.

Adapted for elevations of 40 feet from water to point of discharge.

Extreme depth of suction-pipe, 25 feet.

Fig. 320 is in all respects similar to Fig. 319, except that it has side ears instead of base, and is mounted on grained plank, as shown in cut.

PRICES, ETC., FIGS. 319 & 320

Figure	No.	Bore Inches	Stroke Inches	Gals. per Stroke	Suction Pipe Inches	Top Disch'ge Inches	Side Disch'ge Hose	Iron		Brass-Lined	
								Cipher	Price	Cipher	Price
319 {	4	3	7	.428	1½	1½	1	Cuckoo	\$25.00	Cucumber	\$31.00
	6	3½	8	.666	2	2	1½	Cuculine	40.00	Cucurbite	46.00
320 {	4	3	7	.428	1½	1½	1	Cud	25.00	Cuddle	31.00
	6	3½	8	.666	2	2	1½	Cudbear	40.00	Cuddy	46.00

Double-Acting Force Pump

FOR WINDMILL OR OTHER POWER

Figure 253 is heavily constructed, and especially adapted for continuous service in factories or other locations where there is no danger of freezing. The water may be removed to avoid freezing, by raising the piston to its extreme height, and opening the drain plugs.

The valves are all under the bonnet, shown in front, and can be removed without disturbing the pipes.

We can furnish a geared counter-shaft (Fig. 263), with suitable face-plate and rod to fit this pump, at reasonable additional charge.

Prices quoted on application for pumps constructed entirely of brass with spring piston and gun-metal valves.



FIG. 253

- 3 -inch pumps have 1½-inch suction and discharge.
- 3½-inch pumps have 2 -inch suction and discharge.
- 4 -inch pumps have 2 -inch suction and discharge.
- 5 -inch pumps have 2½-inch suction and discharge.
- 6 -inch pumps have 3 -inch suction and discharge.
- 10 -inch pumps have 5 -inch suction and discharge.

PRICES, ETC., FIG. 253

Bore, in Inches	Stroke, in Inches	Gals. per Rev.	Iron As shown in cut		Iron Brass-Lined		With Air-Barrel. (Formerly Fig. 258)			
							Iron		Brass-Lined	
			Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
3	8	.490	Counsel	\$55.00	Fainness	\$63.00	Couchant	\$60.00	Faithly	\$68.00
3	10	.612	Countable	60.00	Faint	69.00	Couched	65.00	Fakir	74.00
3	12	.734	Countant	65.00	Fainting	75.00	Couching	70.00	Falbala	80.00
3½	8	.666	Counter	60.00	Faintness	69.00	Couchless	65.00	Falchion	74.00
3½	10	.833	Counterly	65.00	Fairhood	75.00	Cougar	70.00	Falciform	80.00
3½	12	1.000	Countless	70.00	Fairing	81.00	Cough	75.00	Falcinel	86.00
4	8	.870	Country	70.00	Fairship	85.00	Coughing	75.00	Falcon	90.00
4	12	1.306	Coupable	96.00	Fairyism	116.00	Council	101.00	Falconry	121.00
5	12	2.040	Cosey	110.00	Costella	145.00	Cossack	125.00	Costliness	160.00
5	15	2.550	Cosily	125.00	Coster	165.00	Cosset	150.00	Costly	180.00
6	12	2.930	Cosmetic	125.00	Costful	165.00	Cossist	150.00	Costom	180.00
6	15	3.672	Cosmo	175.00	Costive	215.00	Cossus	200.00	Costrell	240.00
6	18	4.406	Cosmoline	200.00	Costless	275.00	Costal	225.00	Costume	300.00
10	15	10.20	Faillance	400.00	Faiscean	500.00	Faithful	450.00	Faldetta	550.00
10	18	12.24	Fainant	500.00	Faith	625.00	Faithless	550.00	Faldstool	675.00

Double-Acting Force Pump

FOR WINDMILL OR OTHER POWER



FIG. 291

Figure 291 is similar to Fig. 253, shown on previous page, but with tongs adapted for wood bar and is intended for somewhat lighter service.

Fig. 291 can be furnished with stub rod like Fig. 253, or with jamb nuts like Fig. 281, when so ordered.

Adapted for elevations of 60 feet from water to point of discharge.

To avoid freezing, raise the piston to its extreme height and remove the drain plugs.

PRICES, ETC., FIG. 291

Bore Inches	Stroke Inches	Gallons per Rev.	Diameter Pipe	Iron As shown in cut		Same, less Air-Barrel and Cock	
				Cipher	Price	Cipher	Price
2½	7	.298	1½	Crizzle	\$25.00	Croaking	\$22.50
3	7	.428	1½	Croak	30.00	Crochet	25.00
3½	8	.666	2	Croaker	40.00	Crosiate	35.00

Working Heads

FOR WINDMILL OR OTHER POWER



FIG. 447. DOUBLE-ACTING



FIG. 395



FIG. 304

Figure 447 is a working head combined with a double-acting working cylinder. By loosening four cap-screws in the base, all the working parts, including the lower valve and valve-seat, can be withdrawn for inspection or repairs.

Furnished with 6 feet of set-length unless otherwise ordered.

Fig. 395 is regularly fitted for wood bar, as shown in cut, but will be sent with stub rod threaded for iron pipe when so ordered. The rod and stuffing-box are of solid brass, and there is a brass-seated check-valve on the discharge, provided with suitable drain plug to avoid freezing.

Fig. 304 is constructed with guide-stand and tongs for wood bar. Round stub rod with jamb nuts furnished, when so ordered, at same price.

PRICES, ETC., FIG. 447

Style	Bore Ins.	Stroke Ins.	Gals. per Stroke	Suction Pipe	Discharge Pipe	Cipher	Price
As Shown in Cut	3	6	.184	1¼-inch	1-inch	Dizen	\$15.00
Same, with 3-way Cock	3	6	.184	1¼-inch	1-inch	Divulge	17.00

PRICES, ETC., FIG. 395. 8-INCH STROKE

Diameter Inlet Pipe	Diameter Outlet Pipe	Cipher	Price
1¼-inch	1¼-inch	Denshire	\$20.00
1½-inch	1¼-inch	Denshiring	20.00
2-inch	1½-inch	Density	30.00
2½-inch	1½-inch	Dentagra	30.00
3-inch	2-inch	Dentahr	30.00
3½-inch	2-inch	Dentajah	30.00
4-inch	2-inch	Dentakeer	30.00

PRICES, ETC., FIG. 304

Diam. Inlet	Diam. Outlet	10-inch Stroke		16-inch Stroke		18-inch Stroke		20-inch Stroke	
		Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
1½	1½	Ferrite	\$30.00	Ferular	\$35.00	Fesapo	\$38.00	Festerment	\$40.00
1½	1½	Ferron	30.00	Fervence	35.00	Fesaunt	38.00	Festeye	40.00
2	1½	Ferrugo	30.00	Fervently	35.00	Fescue	38.00	Festinate	40.00
2½	1½	Ferryman	30.00	Fervescant	35.00	Fesewise	38.00	Festino	40.00
3	2	Ferter	40.00	Fervid	45.00	Fessitude	48.00	Festival	50.00
3½	2	Fertilely	40.00	Fervidity	45.00	Festal	48.00	Festivally	50.00
4	2	Fertility	40.00	Fervidly	45.00	Festally	48.00	Festive	50.00
4½	2½	Fertilize	40.00	Fervidness	45.00	Fester	48.00	Festively	50.00
5	2½	Fertily	40.00	Fervor	45.00	Festering	48.00	Festoon	50.00

Suitable working sections for any of the above shown on pages 51 to 57.

Working Heads



FIG. 426



FIG. 329



FIG. 428



FIG. 385



FIG. 427

The working heads shown herewith are adapted for use with our working cylinders, shown on pages 53 to 55.

Fig. 329, 385, and 428 are used with a tee in the pipe.

Longer strokes furnished to order at reasonable additional charge.

All rods of cold-rolled solid brass.

PRICES, ETC., FIGS. 329, 385, 426, 427 & 428

Style	For Pipe	Length Stroke Inches	Diameter of Rod	Rod Threaded For	Cipher	Price
Figure 329	1 1/4-inch	12	3/4-inch	3/8-inch pipe on Lower End	Culverin	\$8.00
	1 1/2-inch	12	3/4-inch		Culverkey	8.00
	2 -inch	12	3/4-inch		Culvert	8.00
	2 1/2-inch	12	3/4-inch		Cuma	10.00
	3 -inch	12	3/4-inch		Cumbent	10.00
Figure 385	1 1/4-inch	10	3/4-inch	3/8-inch Pipe Both Ends	Definable	3.00
	1 1/2-inch	10	3/4-inch		Define	3.25
	2 -inch	10	3/4-inch		Definish	3.50
Figure 426	1 1/4-inch	10	3/4-inch	3/8-inch Pipe on Lower End	Disarray	6.00
	1 1/2-inch	10	3/4-inch		Disaster	6.00
	2 -inch	10	3/4-inch		Disavow	6.00
Figure 427	1 1/4-inch	10	3/4-inch	3/8-inch Pipe on Lower End	Disavowal	5.00
	1 1/2-inch	10	3/4-inch		Disbar	5.00
	2 -inch	10	3/4-inch		Disbarked	5.00
Figure 428	1 1/4-inch	6	5/8-inch	1/4-in. Pipe both Ends	Disbase	2.50
	1 1/2-inch	6	5/8-inch	1/4-in. Pipe both Ends	Disbelief	2.50
	2 -inch	6	3/4-inch	3/8-in. Pipe both Ends	Disbench	3.50

Suitable working sections shown on pages 51 to 57.

Lower Cylinders or Working Sections



FIG. 336



FIG. 366



FIG. 237



FIG. 470

Figure 336 has air-barrel and strainer for submerged use. When so ordered we can furnish with valve-seat tapped for suction-pipe.

Fig. 366 is double-acting.

Fig. 237 is very heavily constructed, and is for submerged use only.

Fig. 470 has side ears to adapt it for securing to a wall or post. Prices and dimensions on application.

PRICES, ETC., FIG. 336

Bore	Stroke	Gallons per Stroke	Pipe	Cipher	Price
3 -inch	6½-inch	.199	1¼-inch	Curator	\$8.00
4 -inch	8½-inch	.462	1½-inch	Curatrix	12.00
4½-inch	8½-inch	.585	2 -inch	Curbouly	16.00

PRICES, ETC., FIG. 366

Bore	Stroke	Diameter Pipes	Gallons per Stroke	Cipher	Price
2¼-inch	7-inch	1¼-inch	.24	Dabble	\$10.00
2¾-inch	12-inch	1¼-inch	.41	Dabby	12.50
3 -inch	7-inch	1½-inch	.43	Dabster	12.00
3 -inch	12-inch	1½-inch	.73	Daboya	16.00
4 -inch	7-inch	2 -inch	.76	Dadian	14.00
4 -inch	12-inch	2 -inch	1.30	Dadianess	18.00

PRICE, ETC., FIG. 237

Dimensions	Cipher	Price
10-inch Bore, 16-inch Stroke; Fitted for 4 or 5-inch Pipe, as ordered. Capacity: 4½ Gallons per Stroke.....	Coolness	\$100.00

Lower Cylinders or Working Sections



Fig. 229 is bolted together.

Fig. 230 has cap and seat screwed to outside of cylinder.

Fig. 231 has cap and seat screwed to inside of cylinder.

Fig. 232 has strainer for submerged use.

Figs. 231 and 232 are made only in 16-inch lengths and over.

All cylinders, 14 inches long and over, have brass bailes and poppets.

Porcelain-lined cylinders are not made Fig. 231 style.

When no style is specified on short cylinders, Fig. 229, all iron, will be sent.

Cast brass, brass-lined and brass tube cylinders all take the same list.

Unless otherwise ordered, cylinders will be fitted for pipe and rod as follows:

Bore	Diameter Suction and Discharge Pipe	Rod for Iron Pipe
2-inch	1 -inch	$\frac{1}{4}$ -inch
$2\frac{1}{4}$ - to 3-inch	$1\frac{1}{4}$ -inch	$\frac{1}{4}$ -inch
$3\frac{1}{4}$ - and $3\frac{1}{2}$ -inch	$1\frac{1}{2}$ -inch	$\frac{3}{8}$ -inch
4- and $4\frac{1}{2}$ -inch	2 -inch	$\frac{3}{8}$ -inch
5- and $5\frac{1}{2}$ -inch	$2\frac{1}{4}$ -inch	$\frac{1}{2}$ -inch
6-inch	3 -inch	$\frac{1}{2}$ -inch

For further details, see repair list in back of book.

Lower Cylinders or Working Sections

When ordering working cylinders by telegraph, two cipher words are necessary; the first one for size, the second for style and material. For example: 3 x 10 Fig. 229, all cast brass with brass plunger, would read: "Farmership Xanthoxyl."

CIPHER WORDS FOR STYLE AND MATERIAL

FIGS. 229, 230, 231 & 232

Material	Fig. 229	Fig. 230	Fig. 231	Fig. 232
All Iron	Xanthate	Xanthein	Xanthiar	Xanthid
Iron, with Brass Bail and Poppet	Xanthium	Xanthiuria	Xantho	Xanthocon
Cast-brass Cylinder, Iron Cap and Seat, Brass Bail and Poppet	Xanthodont	Xanthogen	Xantholites	Xanthoma
Cast-brass Cylinder, Iron Cap and Seat, All-brass Plunger	Xanthopous	Xanthopsin	Xanthornus	Xanthosis
All Cast Brass, Brass Plunger...	Xanthoxyl	Xantusia	Xebeo	Xema
Brass Tube Cylinder, Brass Cap and Seat, All-brass Plunger	Xenarthral	Xenelasia	Xenial	Xenichthys
Brass Tube Cylinder, Iron Cap and Seat, Brass Bail and Poppet	Xenisma	Xenium	Xenocichla	Xenocrepis
Brass Tube Cylinder, Iron Cap and Seat, All-brass Plunger	Xenoderm	Xenodochy	Xenogamy	Xenogenic
Brass-lined Cylinder, Iron Cap and Seat, Brass Bail and Poppet	Xenomi	Xenomous	Xenophora	Xenopious
Brass-lined Cylinder, Iron Cap and Seat, All-brass Plunger	Xenorhina	Xenos	Xenotime	Xenotis
Brass-lined Cylinder, Brass Caps and Plunger	Xeransis	Xerantic	Xerodes	Xerophil
Porcelain-lined Cylinder, Iron Caps and Plunger	Xiphias	Xiphoid	Xiphodon	Xiphura

For dimensions, prices, etc., see next page.

Lower Cylinders or Working Sections

PRICES, ETC., FIGS. 229, 230, 231 & 232

Cipher for Size Only	Size	All Iron	Iron	Brass Body or Brass Lined. Iron Caps		All Brass	Iron Porcelain Lined
			Brass Cage and Valve	BrassCage and Valve Iron Follower Plunger	All Brass Plunger		
Farlen	2 x 10	\$3.75	\$4.50	\$7.50	\$8.00	\$10.75	\$5.25
Farmable	2½ x 10	4.00	4.75	7.75	8.25	11.00	5.50
Farmage	2½ x 10	4.35	5.35	8.00	8.50	12.25	5.85
Farmary	2½ x 10	4.70	5.70	8.50	9.00	12.75	6.25
Farmership	3 x 10	5.00	6.25	9.00	9.75	13.50	6.50
Farmhold	3½ x 10	6.00	7.50	9.75	10.50	14.75	7.50
Farmost	3½ x 10	7.00	8.75	10.50	11.50	16.75	8.75
Farmstead	4 x 10	9.00	11.50	13.00	15.50	21.50	11.00
Farnovian	4½ x 10	12.50	15.75	20.00	22.50	30.00	14.50
Faroeese	5 x 10	16.50	20.50	26.50	30.00	40.00	18.50
Farrea	6 x 10	24.00	29.00	40.00	45.00	60.00	26.00
Farrow	2 x 12	5.50	6.25	8.00	9.25	11.25	7.00
Farse	2½ x 12	5.75	6.50	8.25	9.50	11.50	7.25
Fascia	2½ x 12	6.00	7.00	8.50	9.75	12.75	7.50
Fascialist	2½ x 12	6.50	7.50	9.00	10.50	13.25	8.00
Fasciated	3 x 12	7.00	8.25	9.50	11.00	14.00	8.50
Fascicle	3½ x 12	8.00	9.50	10.25	12.00	15.25	9.50
Fascine	3½ x 12	9.00	10.75	11.25	13.75	17.50	10.75
Fasciola	4 x 12	11.50	14.00	14.25	18.00	22.50	13.00
Fashery	4½ x 12	15.00	18.25	22.00	26.00	34.00	17.00
Fashionist	5 x 12	20.00	24.00	30.00	35.00	46.00	22.00
Fastidious	6 x 12	28.50	33.50	45.00	50.00	65.00	30.00
Fastigia	2 x 14	6.00	6.75	8.50	9.75	13.00	7.50
Fasting	2½ x 14	6.25	7.00	9.00	10.25	13.50	7.75
Fastingly	2½ x 14	6.50	7.50	9.25	10.50	14.75	8.00
Fastland	2½ x 14	7.00	8.00	9.75	11.25	15.50	8.50
Fastness	3 x 14	7.50	8.75	10.25	11.75	16.25	9.00
Fastuous	3½ x 14	8.75	10.25	11.00	12.75	17.75	10.00
Fatal	3½ x 14	10.00	11.75	12.25	14.75	21.00	11.50
Fatality	4 x 14	13.00	15.50	15.75	19.00	26.50	15.00
Fateful	4½ x 14	17.50	20.75	24.00	28.00	36.00	19.50
Fatherhood	5 x 14	22.50	26.50	33.00	38.00	50.00	24.50
Fathomers	6 x 14	33.50	38.50	50.00	56.00	70.00	35.00

Cipher words for style and material on previous page.

Lower Cylinders or Working Sections

PRICES, ETC., FIGS. 229, 230, 231 & 232 — CONTINUED

Cipher for Size Only	Size	All Iron	Iron	Brass Body or Brass Lined. Iron Caps		All Brass
			Brass Cage and Valve	Brass Cage and Valve and Iron Follower Plunger	All Brass Plunger	
Fatidie	2 x 16	\$6.00	\$6.75	\$9.00	\$10.50	\$13.75
Fatigate	2½ x 16	6.50	7.25	9.75	11.25	14.50
Fatigation	2½ x 16	7.00	8.00	10.25	11.75	16.00
Fatimite	2¾ x 16	7.50	8.50	10.75	12.25	16.50
Fatiscient	3 x 16	8.00	9.25	11.25	12.75	17.25
Fatness	3¼ x 16	9.75	11.25	12.00	14.00	19.00
Fattrels	3½ x 16	11.25	13.00	13.50	16.00	22.25
Fatvah	4 x 16	14.50	17.00	17.50	20.50	28.00
Fauchard	4½ x 16	18.50	21.75	25.00	30.50	38.75
Faultless	5 x 16	25.00	29.00	35.00	42.00	53.50
Faussard	6 x 16	37.50	42.50	55.00	62.00	75.00
Faveolus	8 x 16	75.00	85.00	100.00	124.00	150.00
Favour	2 x 18	6.75	7.50	9.50	11.00	14.25
Fawcon	2½ x 18	7.00	7.75	10.50	12.00	15.25
Fawner	2½ x 18	7.50	8.50	11.25	12.75	17.00
Fayalite	2¾ x 18	8.00	9.00	11.75	13.25	17.50
Faydom	3 x 18	8.50	9.75	12.25	13.75	18.25
Faytour	3¼ x 18	10.75	12.25	13.00	15.00	20.00
Fazeunda	3½ x 18	12.50	14.25	14.75	17.25	23.50
Feague	4 x 18	16.00	18.50	19.25	22.25	29.75
Fearful	4½ x 18	22.50	25.75	30.00	35.00	43.25
Fearsome	5 x 18	30.00	34.00	40.00	47.00	58.50
Feaster	6 x 18	42.50	47.50	60.00	67.00	80.00
Feateous	8 x 18	90.00	100.00	115.00	134.00	160.00
Feathered	2 x 20	7.50	8.25	10.00	11.50	14.75
Featherless	2½ x 20	8.00	8.75	11.25	12.75	16.00
Feathery	2½ x 20	8.50	9.50	12.25	13.50	17.75
Featish	2¾ x 20	9.00	10.00	12.75	14.25	18.50
Featureless	3 x 20	9.50	10.75	13.25	14.75	19.25
Featurely	3¼ x 20	11.50	13.00	14.00	16.00	21.00
Febricula	3½ x 20	13.50	15.25	16.25	19.00	25.25
Febriſic	4 x 20	17.00	19.50	21.00	24.00	31.50
Feckly	4½ x 20	25.00	28.25	34.00	39.50	47.75
Pecundate	5 x 20	34.00	38.00	45.00	52.00	63.50
Federacy	6 x 20	50.00	55.00	65.00	72.00	85.00
Federative	8 x 20	100.00	110.00	125.00	144.00	170.00

Cipher words for style and material on page 53.

Artesian Well Cylinders

ALL BRASS

WITH BRASS BALL VALVES

Figure 442 is adapted for any well the casing of which is sufficiently large to admit the top and bottom attachments of the cylinder.

Fig. 442 is for use in the deepest wells, and should always be submerged if possible

The intermediate pipe used is somewhat larger than the cylinder, so that the plunger, lower valve and valve-seat can all be withdrawn without disturbing the pipe.

A strainer, or suction basket, is recommended at the bottom

The cylinder is of heavy seamless brass tubing; all working parts are of brass with best quality cupped leathers on piston.

The cut shows rod protruding at top of cylinder, but the regular fitting is male thread on plunger of the size stated in table, without rod, unless specially ordered



FIG. 442



FIG. 442
SECTIONAL VIEW

esian Well Cylinders

PRICES, ETC., FIG. 442

Vertical Inches	Gallons per Stroke	Length Over All Inches	Outside Diameter of Caps Inches	Suction and Discharge Pipes Inches	Plunger Fitted for Rod Inches	Square Wood Rod Inches	Cipher	Price
6	.10	36	2 3/4	1 1/2	3/4	1 1/2	Discourse	\$15.00
6	.16	33	2 1/2	2	3/4	1 1/2	Discuss	19.00
6	.275	35	3 1/4	2 1/2	3/4	1 1/2	Disdainful	28.00
6	.411	37	3 3/4	3	3/4	1 1/2	Disedify	36.00
4	.61	45	3 3/4	3	3/4	1 1/2	Diselder	38.00
0	.77	51	3 3/4	3	3/4	1 1/2	Disembark	40.00
6	.574	41	4 7/8	3 1/2	3/4	2	Disembroil	48.00
4	.862	49	4 7/8	3 1/2	3/4	2	Disempire	52.00
0	1.06	55	4 7/8	3 1/2	3/4	2	Disenable	55.00
6	1.292	61	4 7/8	3 1/2	3/4	2	Disenchant	58.00
6	.764	43	5 1/4	4	3/4	2 1/2	Disenroll	70.00
4	1.147	51	5 1/4	4	3/4	2 1/2	Disentitle	75.00
0	1.374	57	5 1/4	4	3/4	2 1/2	Disfancy	80.00
6	1.72	63	5 1/4	4	3/4	2 1/2	Disfavor	85.00
6	.982	45	5 3/4	4 1/2	1 1/2	2 1/2	Disgavel	90.00
4	1.473	53	5 3/4	4 1/2	1 1/2	2 1/2	Disgrace	95.00
0	1.842	59	5 3/4	4 1/2	1 1/2	2 1/2	Disgrust	100.00
6	2.21	65	5 3/4	4 1/2	1 1/2	2 1/2	Dish	105.00
6	1.227	47	6 1/4	5	1 1/2	3	Disheir	127.50
4	1.84	55	6 1/4	5	1 1/2	3	Dishevel	135.00
0	2.30	61	6 1/4	5	1 1/2	3	Dishonor	142.50
6	2.76	67	6 1/4	5	1 1/2	3	Dishorn	150.00
6	1.798	54	7 1/4	6	1 1/2	3 1/2	Disjoin	180.00
4	2.690	62	7 1/4	6	1 1/2	3 1/2	Disloyal	195.00
0	3.36	68	7 1/4	6	1 1/2	3 1/2	Disorder	207.50
6	4.04	74	7 1/4	6	1 1/2	3 1/2	Disown	217.50
4	3.716	67	8 3/4	7	1 1/2	4	Displant	300.00
0	4.646	73	8 3/4	7	1 1/2	4	Dispute	320.00
6	5.576	79	8 3/4	7	1 1/2	4	Disquiet	335.00
4	4.9	70	9 1/2	8	1 1/2	5	Disrespect	450.00
0	6.126	76	9 1/2	8	1 1/2	5	Disrobe	480.00
6	7.34	82	9 1/2	8	1 1/2	5	Disrupt	500.00
4	6.247	71	11	9	2	5 1/2	Dissocial	725.00
0	7.809	77	11	9	2	5 1/2	Dissolve	775.00
6	9.37	83	11	9	2	5 1/2	Dissuade	825.00
0	9.18	82	12	10	2	6	Distal	955.00
6	11.02	88	12	10	2	6	Distant	1000.00

Drive Well Points



FIG. 224



FIG. 476



FIG. 477

Figure 224 is covered with brass gauze and perforated brass jacket.

Fig. 476 is made of galvanized pipe, drilled and countersunk, and each hole covered with gauze held in place by a brass washer. (Same list as Fig. 224.)

Fig. 477 is an open-end extension point, and is sold at same list as Fig. 224.

NOTE:—The genuine Douglas Drive-Well Point is galvanized after the holes are punched, and is sold at a somewhat higher price than the common points, which have the holes punched from galvanized pipe.

In Figs. 224 and 477 the length of jacket on all sizes is six inches shorter than the total length of the pipe as given in the table.

When ordering Drive-Well words are necessary; the first for which is given in columns with the figure, which is given below. Douglas Point, would be in

Number 60 gauze is most



FIG. 478

Points by telegraph, two code the size and number of gauze, the prices, and the second for Thus, "1 1/4" x 24", Fig. 224, cipher, "Felanders Conjuno." commonly used.

Fig. 478 is a Malleable Iron Drive Cap for sinking driven wells.

PRICES, ETC., FIG. 478

Size	Cipher	Price
1 1/4-inch	Gabata	\$0.20
1 1/2-inch	Gabbard	.24
2-inch	Gabbatha	.44
2 1/2-inch	Gabber	1.00
3-inch	Gabbing	1.25

Drive Well Points

PRICES, ETC., FIGS. 224, 476 & 477

Length of Point Inches	Number 80 Gauge		Number 90 Gauge	
	Cipher For Size Only	Price per Dozen	Cipher For Size Only	Price per Dozen
24	Feintize	\$33.00	Fenestella	\$52.00
30	Feisty	42.00	Fenster	64.00
24	Felanders	36.00	Fenlander	60.00
30	Felapton	46.00	Fenman	75.00
36	Felawe	56.00	Fennec	90.00
42	Feldsher	66.00	Fennel	105.00
48	Feldspath	76.00	Fennish	120.00
54	Feldyfar	86.00	Fensome	135.00
60	Felfare	96.00	Fensure	150.00
66	Felfit	106.00	Fenugreek	165.00
72	Feliceps	116.00	Feofee	180.00
78	Felician	126.00	Feofment	195.00
24	Felificio	48.00	Feracious	78.00
30	Felicitate	60.00	Feracity	96.00
36	Felicity	72.00	Feral	114.00
42	Felidae	84.00	Ferant	132.00
48	Feliform	96.00	Ferash	150.00
54	Felinia	108.00	Ferberite	168.00
60	Felitomist	120.00	Ferdigew	186.00
66	Fellable	132.00	Ferdwit	204.00
72	Fellah	144.00	Feretered	222.00
24	Fellick	75.00	Feretary	110.00
30	Fellinic	90.00	Feretrum	132.00
36	Fellness	105.00	Ferforth	154.00
42	Fellowess	120.00	Ferial	176.00
48	Fellowred	135.00	Feriation	198.00
54	Fellowship	150.00	Ferinely	220.00
60	Fellside	165.00	Ferineness	242.00
66	Fellware	180.00	Feringee	264.00
72	Feloness	195.00	Ferison	286.00
78	Felonly	210.00	Ferity	308.00
84	Felaite	225.00	Ferling	330.00
90	Felistic	240.00	Fermacy	352.00
96	Felsophrye	255.00	Fermail	374.00
30	Felspathic	155.00	Fermata	220.00
36	Felucca	180.00	Ferment	260.00
48	Felwort	230.00	Fermental	340.00
60	Felyole	280.00	Fermentate	420.00
72	Femalist	330.00	Fermentive	500.00
84	Femalise	380.00	Fermeture	580.00
96	Femme	430.00	Fermillet	660.00
36	Femicide	240.00	Ferngale	340.00
48	Feminal	300.00	Ferniticle	430.00
60	Feminate	360.00	Fernshaw	520.00
72	Feminine	420.00	Fernsmund	610.00
84	Feminism	480.00	Fernyere	700.00
96	Feminye	540.00	Ferocient	790.00
36	Femoral	300.00	Ferocious	430.00
48	Femaunce	360.00	Feroher	520.00
60	Fenberry	420.00	Feronia	610.00
72	Fenceful	480.00	Ferour	700.00
84	Fenceless	555.00	Ferrage	805.00
96	Fencer	630.00	Ferrean	900.00
48	Fencible	480.00	Ferrest	600.00
72	Fendace	630.00	Fereter	840.00
96	Fendille	780.00	Fereting	1080.00
120	Fendliche	930.00	Ferilite	1320.00

Cipher for Fig. 224, (Genuine Douglas)..... "Conjuk"
 Cipher for Fig. 224, (Cheap Point)..... "Conjuno"
 Cipher for Fig. 476..... "Drinkable"
 Cipher for Fig. 477..... "Drinkless"

House Force Pumps

"PENDULUM"



FIG. 209

Figure 209 can be changed into a lift pump by loosening the plug in the top cap. The rocker-shaft is of drop-forged steel. The cylinder is secured to base by loose ears so that the spout can be turned in any direction. Nos. 0, 1 and 2 will be furnished either right or left handed as desired.

Sent right handed, as in cut, unless otherwise ordered.



FIG. 244

Suitable for lifts of 30 feet from water to point of discharge, also very popular for use with hose to spray lawns, etc. Extreme depth of suction-pipe, 25 feet.

Fig. 244 is similar in all respects to Fig. 209, but has cock in spout, shown in cut.

PRICES, ETC., FIG. 209

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Suct'n Pipe	Dis'rg'e for Hose	Iron		Brass Lined	
						Cipher	Price	Cipher	Price
00	2	4	.054	1	$\frac{3}{4}$	Concuss	\$9.00	Condensend	\$13.00
0	2 $\frac{1}{2}$	4 $\frac{1}{2}$	.095	1	$\frac{3}{4}$	Concussion	10.00	Condign	14.00
1	3 $\frac{1}{8}$	6	.220	1 $\frac{1}{4}$	1	Condemn	12.00	Condiment	18.00
2	4	7 $\frac{1}{4}$	.382	2	1 $\frac{1}{4}$	Condense	20.00	Condition	28.00

PRICES, ETC., FIG. 244

Size	Iron		Brass Lined	
	Cipher	Price	Cipher	Price
Number 0	Cornless	\$12.50	Coronate	\$16.50
Number 1	Corny	15.00	Coronation	21.00
Number 2	Corona	25.00	Coronet	33.00

House Force Pumps



FIG. 9

Figure 9 has a differential plunger, rendering the pump double-acting. It is adapted for elevations of 30 feet from water to point of discharge. The cylinder is secured to base by loose ears. The rod and valve-seat are of cast brass. Extreme depth of suction-pipe, 25 feet.



FIG. 241

Fig. 241 is adapted for securing to a wall or post by means of the bracket flange, shown in cut. The rod, stuffing-

box and valve-seat are of cast brass. The cylinder and brake can each be turned in any direction.

Suitable for elevations of 30 feet from water to point of discharge. Extreme depth of suction-pipe, 25 feet.

PRICES, ETC., FIG. 9

No.	Bore Inches	Stroke Inches	Diam. Suct'n Pipe Inches	Gals. per Stroke	Iron		All Brass, except Brake, Stand and Flange	
					Cipher	Price	Cipher	Price
2	2½	5¼	1¼	.111	Cake	\$10.00	Calcine	\$25.00
6	3½	5¾	1½	.240	Calamity	16.00	Calcite	43.00

PRICES, ETC., FIG. 241

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diameter Suction Pipe	Iron		Brass Cylinder Below Spout		Brass Cylinder with Air-Barrel & Cock	
					Cipher	Price	Cipher	Price	Cipher	Price
0	2	4	.054	1	Copyhold	\$10.00	Cord	\$15.50	Cordovan	\$20.00
1	2¼	4	.069	1	Coquet	10.75	Cordax	15.75	Corduoy	21.50
2	2½	5	.106	1¼	Coquetry	11.50	Corded	16.00	Cordwain	23.00
3	2¾	5	.129	1¼	Coquettish	12.25	Cordial	16.75	Cordyle	28.00
4	3	5¼	.160	1½	Coral	13.50	Cordially	18.25	Corella	34.50

House Force Pumps

"IMPROVED"



FIG. 12



FIG. 91



FIG. 157

Figure 12 is well adapted to stand in a kitchen or to use on lawns for spring, etc. The stand will swivel in any direction desired. The rod, stuffing, and valve-seat are of solid brass. The brass cylinder style has loose ears Fig. 264. This pump is not anti-freezing.

Fig. 12 is suitable for lifts of 30 feet from water to point of discharge. Extreme depth of suction-pipe, 25 feet.

Fig. 91 is Fig. 12 with air-barrel added. A quarter-turn gooseneck (Fig. 264) can be furnished, when desired, for pumping into a pail.

Fig. 157 is Fig. 12 with air-barrel and cock added.

To adapt any of the above for acids or hot-water use by adding metal valves and suitable packing, see page 65.

PRICES, ETC., FIG. 12

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Suction Pipe Inches	Iron		Brass Cylinder Below Spout		All Brass Cylinder Head & Discharge	
					Cipher	Price	Cipher	Price	Cipher	Price
0	2	4	.054	1	Call	\$8.00	Callous	\$13.50	Calomel	\$18.00
1	2 1/4	4	.069	1 1/4	Calla	8.75	Callow	13.75	Caloric	19.00
2	2 1/2	5	.106	1 1/4	Called	9.50	Calm	14.00	Calorific	21.00
3	2 3/4	5	.129	1 1/4	Calli	10.25	Calmer	14.75	Calumet	26.00
4	3	5 1/4	.160	1 1/2	Calling	11.00	Calmly	15.75	Calumner	32.00
6	3 1/2	5 1/2	.230	2	Calliopea	17.00	Calmness	24.00	Calumny	38.00

PRICES, ETC., FIG. 91

0	2	4	.054	1	Cessation	\$9.50	Chaff	\$15.00	Chalet	\$19.00
1	2 1/4	4	.069	1 1/4	Cessible	10.25	Chagrin	15.25	Chalice	21.00
2	2 1/2	5	.106	1 1/4	Cession	11.00	Chair	15.50	Chalk	22.00
3	2 3/4	5	.129	1 1/4	Cessment	11.75	Chairman	16.25	Challenge	27.00
4	3	5 1/4	.160	1 1/2	Cestus	13.00	Chaise	17.75	Chamber	34.00
6	3 1/2	5 1/2	.230	2	Chaco	20.00	Chaldean	27.00	Chameleon	41.00

PRICES, ETC., FIG. 157

0	2	4	.054	1	Cloud	\$11.00	Clovered	\$16.50	Clubber	\$21.00
1	2 1/4	4	.069	1 1/4	Cloudless	11.75	Cloverly	16.75	Clubbing	22.00
2	2 1/2	5	.106	1 1/4	Cloudy	12.50	Clown	17.00	Clubbish	24.00
3	2 3/4	5	.129	1 1/4	Clout	13.25	Clownish	17.75	Clubby	29.00
4	3	5 1/4	.160	1 1/2	Clove	14.50	Club	19.25	Clubman	35.00
6	3 1/2	5 1/2	.230	2	Cloven	21.50	Clubbed	28.50	Cluck	42.00

House Force Pumps

"SIDE FORCE"



FIG. 99



FIG. 59



FIG. 156

Figure 99 is adapted for securing to a wall or post. The rod, stuffing-box and valve-seat are of cast brass. The brake can be placed either right or left handed as desired. Suitable for lifts of 30 feet from water to point of discharge. Extreme depth of suction-pipe, 25 feet. Will be furnished with valve-seat and discharge cap bolted on when so ordered.

Fig. 100 is Fig. 99 less plank. Prices same as Fig. 99.

Fig. 59 is Fig. 99 with air-barrel added.

Fig. 75 is Fig. 59 less plank. Prices same as Fig. 59.

Fig. 156 is Fig. 99 with air-barrel and cock added.

Extra prices for metal valves and suitable packing to adapt Figs. 59, 75, 99, 100 and 156 for hot water or acid use, see page 65.

PRICES, Etc., FIG. 99

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Pipe Inches	Iron		Brass Cylinder Below Spout		All Brass Except Air-Barrel	
					Cipher	Price	Cipher	Price	Cipher	Price
0	2	4	.054	1	Chaos	\$8.00	Chapter	\$13.50	Charity	\$18.00
1	2 1/4	4	.069	1	Chap	8.75	Character	13.75	Charlatan	19.50
2	2 1/2	5	.106	1 1/4	Chapel	9.50	Charade	14.00	Charm	21.00
3	2 3/4	5	.129	1 1/4	Chapelet	10.25	Charcoal	14.75	Charmr	26.00
4	3	5 1/4	.160	1 1/2	Chaperon	11.00	Chariot	15.75	Charmful	32.00
6	3 1/2	5 1/2	.230	2	Chaplain	17.00	Charioteer	24.00	Charming	38.00

PRICES, Etc., FIG. 59

0	2	4	.054	1	Cartway	\$9.50	Casco	\$15.00	Cashmere	\$19.50
1	2 1/4	4	.069	1	Cartwright	10.25	Case	15.25	Casing	21.00
2	2 1/2	5	.106	1 1/4	Caruncle	11.00	Caseling	15.50	Casius	22.50
3	2 3/4	5	.129	1 1/4	Carver	11.75	Casement	16.25	Casket	27.50
4	3	5 1/4	.160	1 1/2	Carving	13.00	Casement	17.75	Casquet	34.00
6	3 1/2	5 1/2	.230	2	Cascade	20.00	Cashier	27.00	Cassette	41.00

PRICES, Etc., FIG. 156

0	2	4	.054	1	Clod	\$11.00	Cloister	\$16.50	Closeting	\$21.00
1	2 1/4	4	.069	1	Clodder	11.75	Close	16.75	Closure	22.50
2	2 1/2	5	.106	1 1/4	Cloddish	12.50	Closely	17.00	Cloth	24.00
3	2 3/4	5	.129	1 1/4	Cloddy	13.25	Closeness	17.75	Clothier	29.00
4	3	5 1/4	.160	1 1/2	Clog	14.50	Closet	19.25	Clothing	35.50
6	3 1/2	5 1/2	.230	2	Cloggy	21.50	Closeted	28.50	Clothless	42.50



FIG. 3

House Force Pumps

"COMMON FORCE"

Figure 3 has much longer leverage than Fig. 59 and similar pumps, and has also a guide for the rod. Furnished with grained plank for securing to a wall or post. The rod and stuffing-box are of cast brass.

Suitable for elevations of 40 feet from water to point of discharge. Extreme depth of suction-pipe, 25 feet.

Fig. 27 is Fig. 3 less plank. The rod is not connected, but is left so that it can be welded any length desired.

Fig. 90 is Fig. 3 with wrought-iron brake and wooden handle-grip, as shown in cut.

Extra prices to adapt the above for acids or hot-water use, see page 65.



FIG. 90

PRICES, ETC., FIG. 3

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Suet'n and Dis'ge Pipes	Iron		All Brass Except Brake and Stands	
					Cipher	Price	Cipher	Price
1	2¼	4¾	.073	1	Cabby	\$14. 50	Cabot	\$27. 50
2	2½	5¼	.111	1¼	Cabin	15. 00	Cabrillet	30. 00
3	2¾	7	.180	1¼	Cabinet	15. 75	Cache	33. 00
4	3	7	.214	1½	Cabiri	16. 50	Cachet	35. 00
5	3¼	7	.251	1½	Cablet	20. 00	Cachou	40. 00
6	3½	7	.232	2	Cabman	22. 00	Cackle	47. 00
8	4	7½	.408	2½	Cabob	32. 00	Cackler	57. 00
10	4½	9½	.654	3	Caboose	40. 00	Cackling	97. 00

PRICES, ETC., FIG. 27

Size	Iron		All Brass, Except Brake, Stands and Connecting Rods	
	Cipher	Price	Cipher	Price
Number 1.....	Cantabile	\$13. 50	Canton	\$21. 00
Number 2.....	Cantaloup	14. 00	Cantoned	24. 00
Number 3.....	Cantata	14. 75	Cantonite	27. 00
Number 4.....	Canted	15. 50	Cantus	33. 00
Number 5.....	Canteen	19. 00	Canvas	36. 00
Number 6.....	Canter	21. 00	Canvasser	46. 00
Number 8.....	Cantering	31. 00	Canyon	56. 00
Number 10.....	Canticle	39. 00	Carabite	96. 00

PRICES, ETC., FIG. 50

No.	Iron		All parts touched by water, of Cast Brass		Iron, with Air-Barrel like Fig. 69		Brass Pump Iron Air-Barrel	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
2	Centuple	\$17. 00	Ceremony	\$32. 00	Falsary	\$18. 50	Familist	\$33. 50
3	Centurion	18. 75	Cerograph	36. 00	Falsehood	20. 25	Famine	37. 50
4	Century	20. 50	Cerolite	39. 00	Falseness	22. 50	Famous	41. 00
5	Cerago	25. 00	Certifier	45. 00	Falsetto	28. 00	Famously	48. 00
6	Ceramic	28. 00	Certify	53. 00	Falsify	31. 00	Famousness	56. 00
8	Cereal	39. 00	Certificate	64. 00	Falter	44. 00	Fanatic	69. 00
10	Cerebral	48. 00	Cessant	105. 00	Faltering	53. 00	Fanatical	110. 00



FIG. 69

House Force Pumps

"COMMON FORCE"

Figure 69 is same as Fig. 3 on previous page, but with air-barrel added, as shown in cut.

Will be furnished with air-barrel having two outlets, when so ordered, without extra charge.

Fig. 153 is same as Fig. 69, but with cock added on the discharge.

Extra prices for metal valves and canvas packing to adapt Figs. 3, 4, 12, 27, 28, 29, 59, 69, 71, 72, 75, 90, 91, 99, 100, 116, 153, 155, 156, 157, 168, 1241, 282, 306 and 307 for hot water or acids:

No.	PRICE NET	\$	¢
1	1	75	
2	2	00	
3	2	50	
4	3	00	
5	3	25	
6	3	50	
8	4	00	
10	4	75	



FIG. 153

PRICES, ETC., FIG. 69

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Suct'n and Disch'g Pipes	Iron		All Brass, Except Air- Barrel and Cylinder	
					Cipher	Price	Cipher	Price
1	2 1/4	4 1/4	.073	1	Cater	\$16.00	Cathedral	\$29.00
2	2 1/4	5 1/4	.111	1 1/4	Caterer	16.50	Catholic	31.50
3	2 1/4	7	.180	1 1/4	Cateress	17.25	Catling	34.50
4	3	7	.214	1 1/4	Caterwaul	18.50	Catmint	37.00
5	3 1/4	7	.251	1 1/4	Catfish	23.00	Catnip	43.00
6	3 1/2	7	.292	2	Catgut	25.00	Catoose	50.00
8	4	7 1/4	.408	2 1/4	Cathartic	37.00	Catskill	62.00
10	4 1/2	9 1/4	.654	3	Cathead	45.00	Catsup	102.00

Deduct \$1.00 from list when not mounted on plank.

PRICES, ETC., FIG. 153

Style	Iron		All Brass, Except Air- Barrel and Cylinder	
	Cipher	Price	Cipher	Price
Number 1	Clay	\$17.50	Cleane	\$30.50
Number 2	Clayiah	18.50	Cleanser	33.50
Number 3	Claymore	19.25	Cleansing	36.50
Number 4	Clean	21.00	Clear	39.50
Number 5	Cleaner	26.00	Clearing	48.00
Number 6	Cleanish	28.00	Clearly	53.00
Number 8	Cleanly	40.00	Cleanness	65.00
Number 10	Cleanness	48.00	Cleaver	105.00

Deduct \$1.00 from list when not mounted on plank.

House Force Pumps

"COMMON FORCE"

Figure 155 is Fig. 3 without the brake and stand, mounted on short plank.

The rod is left plain for welding, but can be fitted with thread and jamb nuts when so ordered.

Fig. 29 is similar to our Fig. 3 and other force pumps shown on previous pages, except that the piston-rod is shorter and has no guide.

Fig. 28 is Fig. 29 less plank. The connecting-rod is not welded together unless so ordered.

Extra prices to adapt any of the above for acids or hot water, see page 65.



FIG. 155



FIG. 29

PRICES, ETC., FIG. 155

No.	Bore Inches	Stroke Inches	Iron		Brass		Iron, with Air- Barrel		Brass, with Air- Barrel of Iron	
			Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
2	2½	5½	Climatic	\$13.50	Clinking	\$28.50	Fanciful	\$15.00	Fantail	\$30.00
3	2½	7	Climax	14.25	Clip	31.50	Fanciless	15.75	Fantan	33.00
4	3	7	Climb	15.00	Clipper	33.50	Fandango	17.00	Fantasia	35.50
5	3½	7	Climber	18.50	Clipping	38.50	Fanfare	21.50	Fantasque	42.50
6	3½	7	Cling	20.00	Clivity	45.00	Fang	23.00	Fantassin	48.00
8	4	7½	Clinging	28.00	Cloak	53.00	Fangled	33.00	Fantastic	58.00
10	4½	9½	Clingstone	35.00	Cloaking	92.00	Fankwai	40.00	Fantoc	97.00
13	6	12	Clink	100.00	Clock	250.00	Fanning	110.00	Fanwise	260.00

PRICES, ETC., FIGS. 29 & 28

No.	Figure 29				Figure 28 (No Plank)			
	Iron		Brass		Iron		Brass	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
1	Capito	\$12.00	Capriole	\$25.00	Capable	\$11.00	Caperer	\$24.00
2	Caplin	12.50	Caprone	27.50	Capacious	11.50	Capering	26.50
3	Capper	13.25	Capronic	30.50	Caparison	12.25	Capful	29.50
4	Caprice	14.00	Caprovis	32.50	Cape	13.00	Capias	31.50
5	Capricorn	17.50	Capryl	37.50	Capella	16.50	Capillary	36.50
6	Caprify	19.00	Capsal	44.00	Caper	18.00	Capital	43.00

House Force Pumps

Figure 168 is for light service. The cylinder and all parts traversed by the water are of brass. The cylinder can be swiveled in any direction desired by loosening the screws in the clamps.

Fig. 72 "Extra-Finish Pump," has cylinder and all parts traversed by the water, of brass. The exterior is highly finished, making a very ornamental article. The cylinder can be swiveled to any point desired by loosening the screws in the clamps.

Fig. 72 furnished with iron cock on air-barrel at \$2.25 extra list; brass cock, \$7.00 extra; plain copper air-barrel, one outlet, \$7.00 extra.

Fig. 71 is Fig. 72 less air-barrel, with discharge cap for lead pipe.

FIG. 168

FIG. 72

To adapt any of the above for acids or hot water use, see page 65.

PRICES, ETC., FIG. 168

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Suction Pipe Inches	Discharge Pipe Inches	Cipher	Price
0	2	7	.095	1	1	Cobstone	\$12.00
3	2½	7	.214	1½	1½	Cobtop	20.00

PRICES, ETC., FIGS. 72 & 71

No.	Bore Inches	Stroke Inches	Gallons per Stroke	Suction & Discharge Pipes	With Iron Air-Barrel		With Polished Copper Air-Barrel, Two Outlets		Without Air-Barrel Fig. 71	
					Cipher	Price	Cipher	Price	Cipher	Price
0	2	7	.095	1	Caurus	\$24.00	Caulome	\$34.00	Caulk	\$23.00
3	2½	7	.149	1½	Causable	28.00	Cauma	38.00	Caulker	27.00
3	2½	7	.214	1½	Cause	31.00	Caumatic	42.00	Caulking	30.00



FIG. 4

Common Force Pump

ADAPTED FOR WELLS OVER
TWENTY-FIVE FEET DEEP

Figure 4 shows an arrangement of a side-ejector pump for wells of medium depth. The pump is set within suction distance of the water upon a plank or other suitable support.

As listed, we furnish the pump, brake and stand and air-barrel. The intermediate rod and pipes may be furnished at reasonable extra charge.

Nos. 2 to 6, inclusive, are without guide for the rod (like Fig. 29). Nos. 8 and 10 have guide for the rod (like Fig. 3).

Adapted for total lifts of 40 feet from water to point of discharge. Extreme depth of suction-pipe 25 feet.

To fit for acids or hot water, see page 65.

PRICES, ETC., FIG. 4

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diameter Suction and Discharge Pipes	Iron		Brass Pump	
					Cipher	Price	Cipher	Price
2	2½	5¼	.111	1¼	Cacoon	\$15.00	Cadence	\$30.00
3	2¾	7	.180	1½	Cacti	15.75	Cadene	33.00
4	3	7	.214	1½	Cactus	16.50	Cadenza	35.00
5	3¼	7	.251	1½	Cadaver	20.00	Cadger	40.00
6	3½	7	.292	2	Caddie	22.00	Cadus	47.00
8	4	7½	.408	2½	Caddis	35.00	Cafe	60.00
10	4½	9½	.654	3	Caddy	44.00	Caffre	101.00

House Force Pumps

DOUBLE - ACTING

LETTER "A"

Figure 26 has double-acting cylinder with valves at top and bottom. The rod and stuffing-box are of cast brass.

Adapted for elevations of 40 feet from water to point of discharge. Extreme depth of suction-pipe, 25 feet.

Fitted with coupling and thread tube on suction and discharge.

Fig. 25 is Fig. 26 less plank. The brake and stand are detached so that any length of connecting-rod can be welded in.

Fig. 66 is Fig. 26 with air-barrel as shown. Will furnish air-barrel with both top and side discharge when so ordered.



FIG. 26



FIG. 66.

PRICES, ETC., FIG. 26

Bore Inches	Stroke Inches	Gals. per Stroke	Suction and Discharge Pipes	Iron		Brass	
				Cipher	Price	Cipher	Price
2 1/4	4 1/4	.146	1	Cannibal	\$15.00	Canoe	\$30.00
2 1/2	5 1/4	.222	1 1/4	Cannon	17.00	Canoeing	33.00
2 3/4	6 1/4	.320	1 1/2	Cannonade	19.00	Canoeist	36.00
3	6 3/4	.428	1 3/4	Cannoneer	21.00	Canonees	40.00
3 1/4	7	.502	1 1/2	Cannoning	23.00	Canonial	56.00
3 1/2	8	.584	2	Cannonry	25.00	Canonic	69.50
4	8 1/4	.816	2	Cannula	37.00	Canonist	94.00
4 1/4	10	1.308	2 1/2	Canny	50.00	Canonry	136.00

PRICES, ETC., FIGS. 25 & 66

Figure 25				Figure 66			
Iron		Brass		Iron		Brass	
Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
Candidly	\$14.00	Canephore	\$29.00	Castigate	\$16.50	Catacomb	\$31.50
Candidness	16.00	Canful	32.00	Castigator	18.50	Catafalque	34.50
Candied	18.00	Canine	35.00	Castle	20.50	Catalpa	37.50
Candle	20.00	Canister	39.00	Castor	23.00	Catamaran	42.00
Candor	22.00	Canker	55.00	Casual	26.00	Catamount	59.00
Cane	24.00	Cankered	68.50	Casualism	28.00	Catapult	72.50
Caned	36.00	Cankorous	93.00	Casualty	42.00	Cataract	99.00
Canella	49.00	Cannery	135.00	Casuist	55.00	Catarrh	141.00

As listed the brass pumps have iron air-barrels.
Extra prices for metal valves, etc., see page 70.

House Force Pumps

DOUBLE - ACTING

LETTER "A"



FIG. 233

Figure 233 is the same as Fig. 66 on previous page, with the addition of a cock on the discharge.

Fig. 154 is Fig. 66 on previous page, without the brake and stand, and mounted on short plank.

Bore, stroke and capacity shown under Fig. 26 on previous page.

As listed, the brass pumps have iron air-barrel.



FIG. 154

PRICES, ETC., FIGS. 233 & 154

Figure 233					Figure 154			
No.	Iron		Brass		Iron		Brass	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
1	Contest	\$18.00	Continuous	\$33.00	Clematis	\$15.00	Clerk	\$30.00
2	Contestant	20.50	Contort	36.50	Clemency	17.00	Clerking	33.00
3	Contested	22.50	Contortion	39.50	Clench	19.00	Clerkship	36.00
4	Context	25.50	Contradict	44.50	Clencher	21.50	Cleave	40.50
5	Contexture	29.00	Contralto	62.00	Clergy	24.50	Clever	57.50
6	Continent	31.00	Contrary	75.50	Clergyman	26.00	Cleverly	70.50
8	Contingent	45.00	Contrast	102.00	Cleric	38.00	Client	95.00
10	Continue	58.00	Contribute	144.00	Clerical	50.00	Cliff	136.00

Extra net prices for metal valves and canvas-packed piston to adapt Fig. 25, 26, 66, 154 and 233 for hot water or acids:

Nos.	1	2	3	4	5	6	8	10
PRICES	\$1.75	\$2.25	\$2.50	\$3.00	\$3.50	\$4.25	\$6.00	\$8.00

House Force Pumps

DOUBLE-ACTING

LETTER "B"



FIG. 67

Figure 67 is a type of double-acting pump with all the valves under the bonnet cap shown in front. The piston is always primed, since the inlet is at the top of the cylinder. The rod and stuffing-box are of cast brass. To avoid freezing, raise the piston to its extreme height and loosen the vent plugs.

Fig. 68 is Fig. 67 less plank, and with the connecting-rod detached, unless otherwise ordered.

Fig. 234 is on the same principle as Fig. 67. The bonnet cap is so arranged that the valves can be cleaned or repaired without disturbing the pipes.



FIG. 234

Fig. 234 has leather-faced poppet valves.

PRICES, ETC., FIG. 67

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Fitted for Pipe	As Shown in Cut		With Air-Barrel		With Air-Barrel & Cock	
					Cipher	Price	Cipher	Price	Cipher	Price
2, Iron	2½	5½	.222	1½	Catawba	\$14.00	Farancia	\$15.50	Farcing	\$17.50
2, Brass	2½	5½	.222	1½	Catch	29.00	Farantly	30.50	Farctate	32.50
3, Iron	2½	6½	.328	1½	Catcall	16.00	Farce	17.50	Fardel	19.50
3, Brass	2½	6½	.328	1½	Catcher	35.00	Farceial	36.50	Farding	38.50

PRICES, ETC., FIG. 68

Size	Material	Cipher	Price
No. 2	Iron	Catching	\$13.00
No. 2	Brass	Catechism	28.00
No. 3	Iron	Catchup	15.00
No. 3	Brass	Category	34.00

PRICES, ETC., FIG. 234

No.	As Shown in Cut		Not Mounted		Mounted With Air-Barrel		Mounted, with Air-Barrel and Cock	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
4, Iron	Contrite	\$25.00	Farewell	\$24.00	Farmeress	\$27.00	Farmstead	\$29.50
4, Brass	Contuse	45.00	Farina	44.00	Farmary	47.00	Farness	49.50
4½, Iron	Contritely	30.00	Farinose	29.00	Farhold	32.00	Faro	34.50
6, Iron	Contribution	45.00	Farmable	44.00	Farming	50.00	Faroish	53.00
8, Iron	Control	65.00	Farmer	64.00	Farmost	72.00	Farogo	75.00

DETAILS TO FIG. 234

No.	Bore	Stroke	Gals. per Stroke	Pipe	Extra for Brass Lining
4	3 -inch	7-inch	.428	1½-inch	\$3.50
4½	3 -inch	10-inch	.612	1½-inch	4.00
6	3½-inch	10-inch	.834	2 -inch	6.00
8	4 -inch	8-inch	.870	2 -inch	10.00

Force Pumps with Balance-Wheel



FIG. 282

Figure 282 is Fig. 59 with crank-shaft and balance-wheel in place of brake and stand. This greatly facilitates the ease of operation. Fig. 282 can be arranged with pulley or pulley balance-wheel for belt power, when so ordered, at reasonable additional charge. Can also be furnished with brass pump in place of iron.

Fig. 306 is a side-plate Force Pump, similar to Fig. 241, on page 61, with cock and balance-wheel, as shown. The cylinder is secured by loose ears, and can therefore be turned in any direction desired. Provided with suitable pulley for belt power, or with brass pump, when so ordered, at reasonable additional charge.

Fig. 306 pump is fitted with bolted discharge-cap, unless otherwise ordered.

Extra for metal valves to adapt for hot water use, see page 65.



FIG. 306

PRICES, ETC., FIG. 282

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Fitted for Pipe	As Shown in Cut		With Cock on Discharge	
					Cipher	Price	Cipher	Price
2	2½	5	.106	1¼	Cricket	\$27.00	Crimp	\$29.00
3	2¾	6	.154	1¼	Crimean	28.00	Crimper	30.00
4	3	6	.184	1½	Crimeless	30.00	Crimple	32.00
5	3¼	6	.215	1½	Criminal	35.00	Crimson	38.00
6	3½	6½	.250	2	Criminate	39.00	Crinch	42.00

PRICES, ETC., FIG. 306

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Fitted for Pipe	As Shown in Cut		Without Air-Barrel and	
					Cipher	Price	Cipher	Price
2	2½	5	.106	1¼	Cruel	\$29.00	Crumb	\$25.00
3	2¾	6	.154	1¼	Cruelly	30.00	Crumble	26.00
4	3	6	.184	1½	Cruet	32.50	Crummet	28.00
5	3¼	6	.215	1½	Cruise	38.00	Crump	32.00
6	3½	6½	.250	2	Cruller	42.00	Crumpet	36.00

Force Pumps with Balance-Wheels



FIG. 307

Figure 307 is Fig. 3, page 64 mounted with balance-wheel to facilitate its operation. Can be furnished with pulley, or pulley balance-wheel for belt power, when so ordered,—also with brass pump—at reasonable additional charge.

Fig. 116 is Fig. 3, page 64, mounted with balance-wheel and crank-shaft having handles for two men. Can mount our Double-Acting Force Pump, Fig. 26, page 69, in this manner when so ordered, at reasonable additional charge.

Nos. 2 and 3 takes 24-inch balance-wheel.
Nos. 4 and 5 takes 26-inch balance-wheel.
No. 6 takes 30-inch balance-wheel.

Extra for metal valves for hot water or acid use, see page 65.



FIG. 116

PRICES, ETC., FIG. 307

No.	Bore Inches	Stroke Inches	Gallons per Stroke	Fitted for Pipe	Iron, as in Cut		Iron, with Air-Barrel		Iron, with Air-Barrel and Cook	
					Cipher	Price	Cipher	Price	Cipher	Price
2	2½	5	.106	1½	Crusade	\$27.00	Crushing	\$28.50	Crusting	\$30.50
3	2½	6	.154	1½	Crusading	28.00	Crust	29.50	Crusty	31.50
4	3	6	.184	1½	Crusado	30.00	Crustal	32.00	Crutch	34.50
5	3½	6	.215	1½	Crush	35.00	Cruster	38.00	Cry	41.00
6	3½	6½	.250	2	Crushed	39.00	Crustily	42.00	Crying	45.00

PRICES, ETC., FIG. 116

No.	Bore Inches	Stroke Inches	Gallons per Stroke	Fitted for Pipe	Iron, as in Cut		Iron, with Air-Barrel		Brass, without Air-Barrel	
					Cipher	Price	Cipher	Price	Cipher	Price
2	2½	4½	.090	1½	Christen	\$37.00	Chroma	\$38.50	Chronic	\$52.00
3	2½	6	.154	1½	Christian	38.00	Chromatic	39.50	Chronicle	55.25
4	3	6	.184	1½	Christly	39.00	Chromic	41.00	Chrysene	57.50
5	3½	6	.215	1½	Christmas	42.00	Chromides	45.00	Chubby	62.00
6	3½	6½	.250	2	Christom	46.10	Chromo	49.00	Chuck	71.00

Force Pumps with Balance-Wheels



FIG. 85



FIG. 265

Figure 85 is Fig. 3, shown on page 64, mounted on wood frame with balance-wheel and two cranks, as shown in cut. Fig. 25, page 69, can be so mounted, if desired.

FOR PRICES, ETC., SEE NEXT PAGE

Fig. 265 is a force pump, mounted on iron column, with back gearing and balance-wheel. The ratio of the gears is 3 to 1. We can furnish with 12-inch pulley in place of balance-wheel when so ordered at same list. The double-acting pumps listed below are like Fig. 25, page 69.

FOR PRICES, ETC., SEE NEXT PAGE

Force Pumps with Balance-Wheels

PRICES, ETC., FIG. 85

WITH SINGLE-ACTING PUMP

No.	Bore Inches	Stroke Inches	Gals. per Stroke	Diam. Pipe Inches	Iron Pump		Brass Pump	
					Cipher	Price	Cipher	Price
2	2½	5	.106	1½	Cellist	\$54.00	Cement	\$69.00
3	2½	6½	.167	1½	Cello	55.00	Cementer	72.25
4	3	6½	.198	1½	Cellular	60.00	Cemetery	78.50
5	3½	6½	.232	1½	Celluloid	62.00	Censor	82.00
6	3½	6½	.271	2	Cellulose	65.00	Censorial	90.00
8	4	7½	.406	2	Celt	75.00	Censorship	100.00
10	4½	9	.620	2½	Celtic	90.00	Censure	147.00

WITH DOUBLE-ACTING PUMP

2	2½	5	.213	1½	Census	\$55.00	Centesm	\$71.00
3	2½	6	.309	1½	Cental	56.00	Centetid	73.00
4	3	6½	.397	1½	Centaur	60.00	Centipede	79.00
5	3½	7	.503	1½	Centauruss	65.00	Centner	98.00
6	3½	7½	.625	2	Centavo	70.00	Cento	114.50
8	4	8	.870	2	Centenary	80.00	Central	137.00
10	4½	9	1.239	2½	Centennial	90.00	Centric	176.00

PRICES, ETC., FIG. 265

WITH SINGLE-ACTING PUMP

No.	Bore Inches	Stroke Inches	Gals. per Rev.	Diam. Pipe Inches	Iron Pump		Brass Pump	
					Cipher	Price	Cipher	Price
0	2	6	.082	1	.....	.....	Cow	\$50.00
2	2½	6	.128	1½	.....	.....	Coward	68.00
3	2½	6	.154	1½	Covey	\$63.75	Cowardice	81.00

WITH DOUBLE-ACTING PUMP

1	2½	4½	.155	1	Cowardly	\$53.00	Cower	\$68.00
2	2½	5½	.234	1½	Cowardious	55.00	Cowhead	71.00
3	2½	6	.309	1½	Cowbane	67.00	Cowhide	84.00
4	3	7	.428	1½	Cowbell	71.00	Cowish	90.00
5	3½	7	.503	1½	Cowberry	75.00	Cowkiller	108.00
6	3½	8	.666	2	Cowcumber	80.00	Cowled	124.00

Extra for metal valves to single-acting pump, see page 65.

Extra for metal valves to double-acting pump, see page 70.

House Force Pumps

"MANHATTAN" STYLE

ON FRAME



FIG. 340



FIG. 341

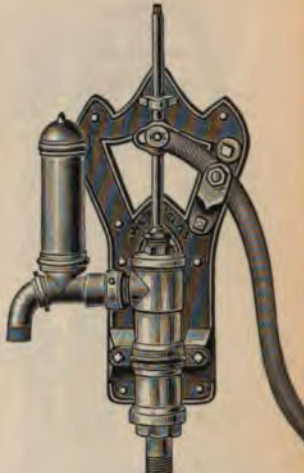


FIG. 343



FIG. 342

Our Manhattan pumps, with swivel cylinder, are extensively used in cities where the pressure is insufficient to carry water to the top floors of buildings. The rod can be lengthened with a piece of gas-pipe and Fig. 342 attached on upper floors. All parts traversed by the water are cast brass. The cylinder has 2-inch bore, 3-inch stroke; capacity per stroke, .041 gallon.

Fig. 340 has check-valve on the discharge, with goose-neck and coupling.

Fig. 341 has gooseneck and coupling on the discharge, but no check-valve.

Fig. 342 is used as an extension on upper floors of buildings. Ends of brass rods are threaded for $\frac{1}{4}$ -inch gas-pipe.

Fig. 343 has air-barrel on the discharge, but no check-valve.

The suction on all of the above pumps is fitted for 1-inch lead pipe unless otherwise ordered. The discharge is threaded for 1-inch pipe, and the gooseneck, which is coupled to same, is for $\frac{3}{4}$ -inch lead pipe.

PRICES OF MANHATTAN PUMPS

Style	Cipher	Price
Fig. 340.....	Cure	\$15.00
Fig. 341.....	Cureless	12.00
Fig. 342.....	Curfew	5.00
Fig. 343.....	Curfish	16.00

House Force Pumps

"MANHATTAN" STYLE

ON BASE



FIG. 399



FIG. 400

Figure 399 is similar to our Fig. 341 on previous page, and is for the same service, but has a flange or base instead of side frame.

The suction is fitted for 1-inch iron pipe unless otherwise ordered. The discharge is threaded for 1-inch iron pipe, with a gooseneck for $\frac{3}{4}$ -inch lead pipe coupled on.

Fig. 400 is the same style of pump as Fig. 399, with brass air-barrel added.

PRICES, ETC., FIGS. 399 & 400

Style	Cipher	Price
Fig. 399.....	Departed	\$12.00
Fig. 400.....	Departing	16.00

House Force Pumps

"WING" OR "CLOCK" STYLE

Figure 418 is a double-acting semi-rotary force pump, well adapted for pumping oils, hot liquids, etc. It is not designed for use on long suction-pipes. The shaft carries two wings with brass valves which act alternately on each side with each motion of the brake.

The wood handle is detachable from the shaft and can be placed so as to work either perpendicularly, as in cut, or horizontally.

Fig. 459 is same as Fig. 418 with flange added for securing to floor or bench.

Extreme depth of suction-pipe, 20 feet. A foot-valve is recommended on long suction-pipes.



FIG. 418



FIG. 459

PRICES, ETC., FIG. 418

No.	For Iron Suction and Discharge Pipes	Gals. per Min.	Iron, Brass Valves, Etc.		All Brass	
			Cipher	Price	Cipher	Price
0	1/4-inch	4	Dictate	\$ 8.00	Difficult	\$16.00
1	3/4-inch	5	Dictation	9.50	Diffident	20.00
2	1-inch	6	Dictator	11.00	Diffuse	27.50
3	1 1/4-inch	9	Diction	13.00	Digest	35.00
4	1 3/4-inch	13	Diet	16.00	Digestion	42.50
5	1 1/2-inch	19	Dietist	20.00	Digestive	50.00
6	1 3/4-inch	22	Dietic	23.50	Digger	60.00
7	2-inch	26	Dietical	27.00	Dight	70.00
8	2 1/2-inch	36	Dietrich	40.00	Digit	90.00

PRICES, ETC., FIG. 459

No.	Iron		Brass Pump	
	Cipher	Price	Cipher	Price
0	Doment	\$ 9.00	Donax	\$17.00
1	Domical	10.50	Donjon	21.00
2	Domicile	12.00	Donkey	28.50
3	Domineer	14.00	Donna	36.00
4	Dominie	17.00	Donnish	44.00
5	Dominion	21.00	Donship	52.50
6	Don	25.00	Doodle	62.50
7	Donary	30.00	Doom	72.50
8	Donate	42.50	Doomful	92.50

Spraying Pumps



FIG. 259
"AQUAPULT"



FIG. 80
IN OPERATION



FIG. 80
"AQUARIUS"

Figure 259 has differential plunger, rendering it double acting. The cylinder and plunger are of drawn brass tubing, the valves are solid brass balls, and all parts traversed by the liquid are of brass. The stirrup is adjustable at any height desired, by means of clamp and thumbscrew.

Fitted regularly with one straight discharge tip and one rose springler, unless otherwise ordered.

The Vermorel Nozzle, Fig. 430 (see next page), makes a very fine spray, and is supplied when ordered at slight additional charge.

Fig. 80 has drawn brass tube cylinder, brass valve-seat, piston, stuffing-box and rod. The air-barrel and step are of cast iron. A check-valve in the air-barrel assists in maintaining a steady stream.

Fitted regularly with one straight discharge tip and one rose sprinkler unless otherwise ordered.

PRICES, ETC., FIG. 259
WITH 3 FEET OF 1-2 INCH DISCHARGE HOSE

Fittings	Cipher	Price
With regular Rose Sprinkler	Couple	\$ 9.00
With "Vermorel" Nozzle	Coupon	10.50

PRICES, ETC., FIG. 80
WITH 2 1-2 FEET OF 3-4 INCH SUCTION HOSE, AND 3 FEET OF 1-2 INCH DISCHARGE HOSE

Fittings	Cipher	Price
With Rose Sprinkler	Celery	\$ 9.00
With "Vermorel" Nozzle	Celes	10.50

Spraying Goods



FIG. 365
AS SENT TO MARKET



FIG. 484



FIG. 485



FIG. 430
VERMOREL NOZZLE

Figure 365 is similar in construction to Fig. 259 on previous page, but adapted for holding with the hands, as shown in the cut. The operator can use this pump while on a ladder or in a tree.

The "Vermorel" is the best type of spraying nozzle on the market, and is highly endorsed by the Agricultural Department and the various State Experiment Stations. The construction of the water passage gives the liquid a whirling motion which produces a very fine spray. All parts are easily got at for cleaning and a pin is provided which can be pressed forward to free the discharge hole when clogged. Fig. 430 is a single, and 484 a double nozzle.

Figs. 430 and 484 are threaded for $\frac{1}{4}$ -inch iron pipe to fit the discharge pipe on Figs. 80, 259 and 365, unless otherwise ordered.

Fig. 485 is a Reduction Coupling. Male end for $\frac{1}{4}$ -inch pipe; female end for $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch hose. Price, 25 cents.

PRICE, ETC., FIG. 365

With Rose Sprinkler..... (Czar).....\$8.00

PRICES, ETC., FIGS. 430 & 484

Style	Cipher	Price
Fig. 430 {	$\frac{1}{4}$ -inch Pipe.....	Disblame \$1.50
	$\frac{1}{2}$ -inch Pipe.....	Disbloom 1.50
	$\frac{3}{4}$ -inch Hose.....	Disbowel 1.50
Fig. 484 {	$\frac{1}{4}$ -inch Pipe.....	Disboweled 2.00
	$\frac{1}{2}$ -inch Hose (Adding Fig. 485).....	Disbrane 2.25
	$\frac{3}{4}$ -inch Hose (Adding Fig. 485).....	Disbuck 2.25

Spraying Pumps

KNAPSACK STYLE



FIG. 421
ONE RESERVOIR



FIG. 446
TWO RESERVOIRS

Figure 421 contains an all-brass double-acting pump, similar to Fig. 259, which is removable for cleaning or repairs.

The discharge is fitted with three feet of $\frac{1}{2}$ -inch hose and three feet of $\frac{1}{4}$ -inch iron pipe, on the end of which is a Vermorel nozzle. A stopcock, which is placed within easy reach of the hand on the end of the hose, is a convenience which will be much appreciated.

A copper tank is necessary for solutions containing sulphate of copper; the galvanized tank will answer for Paris Green or London Purple.

Fig. 446 has two reservoirs, holding five gallons and one and one-fourth gallons respectively. There is a tee on the suction-pipe so that liquid can be drawn from each tank in the proportion required. A stopcock at the bottom of the small reservoir and a thumb-nut on top of the large one regulate the flow.

The small reservoir can be detached when it is desired to use only one kind of insecticide.

Fig. 446 will be found especially useful in making and applying an emulsion of kerosene, or ammoniacal carbonate of copper.

PRICES, ETC., FIGS. 421 & 446

Style	Tank	Cipher	Price
Fig. 421.....	Copper	Dimness	\$14.00
Fig. 421.....	Galvanized Iron	Dimple	12.00
Fig. 446.....	Copper	Divorcee	20.00

Spraying Pumps

DOUBLE-ACTING



FIG. 431

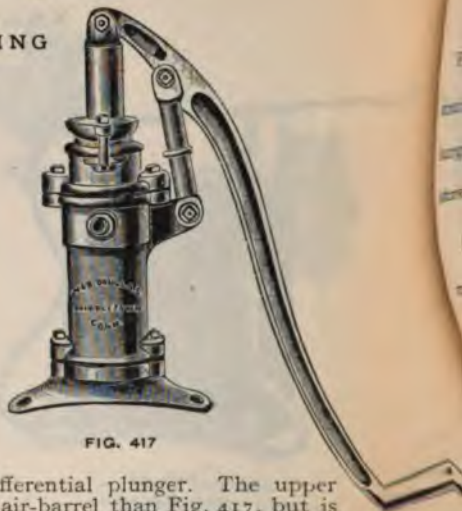


FIG. 417

Figure 431 is double-acting, having a differential plunger. The upper cylinder is brass lined. The pump has larger air-barrel than Fig. 417, but is similar to it in many respects. The suction is fitted for 1-inch iron pipe, and the discharge for $\frac{3}{4}$ -inch hose.

Fig. 417 has differential plunger, covered with brass to prevent corrosion. It throws a continuous stream. The curved base can be used either on side or head of barrel. There are discharge openings on each side, fitted for $\frac{3}{4}$ -inch hose, either one of which can be used for a return pipe to keep the mixture from settling.

Fitted for 1-inch iron pipe suction with brass suction basket, unless otherwise ordered. Suction and discharge-pipes, with appropriate fittings, at reasonable extra charge.

PRICES, ETC., FIG. 431

2½-inch Bore	Iron		Brass-lined	
	Cipher	Price	Cipher	Price
Pump only.....	Disbud	\$9.00	Disburden	\$11.00
Pump, with 3 feet of 1-inch suction-pipe with strainer; one line of $\frac{3}{4}$ -inch discharge-hose, 5 feet long, with Vermorel or Gem nozzle.....	Disbudded	13.00	Disbursal	15.00
Same, with return pipe to keep solution agitated.....	Disbudding	14.50	Disburse	16.50
Pump, with suction-pipe and strainer and two lines of $\frac{3}{4}$ -inch discharge-hose 5 feet long.....	Disbulge	16.00	Discal	18.00

Extra for metal lower valve, \$1.50 net.

PRICES, ETC., FIG. 417. 2 1-2 INCH BORE

Material	Cipher	Price
Brass-covered Plunger, iron cylinder.....	Dibble	\$ 8.50
Solid Brass Plunger, brass outside cylinder.....	Dice	14.00

Extra for metal lower valve, \$1.50 net.

Spraying Pump

Figure 420 is a single-acting pump, similar to our Fig. 91, page 62. The large air-barrel aids in furnishing a steady stream.

A single-acting pump is preferred by many as being less fatiguing to the operator.

The rod and stuffing-box are of solid brass.

Fitted with 2 $\frac{3}{4}$ feet of suction-pipe, 10-foot discharge-hose with spray nozzle, and 4-foot return hose to keep the mixture from settling.



FIG. 420

PRICES, ETC., FIG. 420

No.	Bore Inches	Iron		Brass Cylinder Below Spout		Brass Pump Except Air- Barrel	
		Cipher	Price	Cipher	Price	Cipher	Price
0	2	Dignify	\$10.00	Dilate	\$13.50	Dim	\$19.00
2	2 $\frac{1}{2}$	Dignotion	12.00	Dilation	16.00	Dime	24.00
4	3	Digress	14.00	Dilatory	18.00	Diminish	34.00

Above prices do not include barrel.

Mounted on 50-gallon barrel at \$1.00 net extra.

EXTRA NET PRICES FOR METAL VALVES AND CANVAS PACKING

Number 0	Number 2	Number 4
\$2.00	\$2.50	\$3.00

Spraying Pumps



FIG. 410
"PALMETTO"

Figure 410 is a strong and serviceable force pump, adapted for spraying and many other uses. The valve-seat is brass bushed and the rod is brass covered.

The pump can be provided with self-priming piston (like Fig. 409, page 13), when so ordered, at reasonable charge.

There is a priming plug at the top and a drain plug at the bottom of every cylinder.

Adapted for elevations of 35 feet from water to point of discharge.

Extreme depth of suction-pipe, 25 feet.

To avoid freezing on self priming pump, raise the plunger to its extreme height, and loosen the drain plug.

On pump with regular piston lower the plunger until it trips the valves.

Suction fitted for $1\frac{1}{4}$ -inch iron pipe.

Discharge fitted for $1\frac{1}{4}$ -inch iron pipe with coupling and tube for $\frac{3}{4}$ -inch hose

Fig. 350 is a compact form of force pump, well adapted for spraying at similar uses.

The cylinder, rod and stuffing-box are of cast brass. The flange is brass bushed and secured to the cylinder by loose ears, which allow the spout to be turned in any direction.

Suction fitted for $1\frac{1}{4}$ -inch iron pipe.

Discharge fitted for 1-inch hose.



FIG. 350
"NOVELTY"

PRICES, ETC., FIG. 410. 31-2 INCH BORE

Style	Cipher	Price
With Regular Piston	Detest	\$10.00
With Self-priming Piston.....	Detested	13.00

PRICE, ETC., FIG. 350

Style	Cipher	Price
4-inch bore, 4-inch stroke, capacity .218 gallons per stroke,	Cutlass	\$20.00

Spraying Pump



FIG. 398
IN OPERATION

Figure 398 is our Fig. 400 (page 77) with metal valves, fitted with 3 feet of 1-inch suction-pipe and suitable holder for attaching to a barrel. The piston is canvas packed.

Cylinder, 2-inch bore.

Fitted for 1-inch suction-pipe; discharge fitted for $\frac{3}{4}$ -inch hose.

Will furnish mounted on 50-gallon barrel for \$16.00 net extra.

PRICE, ETC., FIG. 398

Pump only (Depaint) \$16.00

For other spraying pumps and spraying engines, see

Fig. 236.....	Page 104
Fig. 8.....	" 138
Fig. 40.....	" 138

Hydraulic Ram



FIG. 77
AS SENT TO MARKET

For explanation and table of efficiency, see next two pages.

PRICES, ETC., FIG. 77

No.	Minimum and Maximum of Supply in gallons per minute	Length of Drive Pipe in Feet	Sizes of Pipes in Inches		Cipher	Price
			Drive	Discharge		
2	$\frac{1}{2}$ to 2	12 to 50	$\frac{3}{4}$	$\frac{3}{4}$	Caw	\$9.00
3	$1\frac{1}{2}$ to 4	12 to 50	1	$\frac{1}{2}$	Caxon	11.00
4	3 to 7	12 to 50	$1\frac{1}{4}$	$\frac{1}{2}$	Cayenne	14.00
5	6 to 14	25 to 100	2	$\frac{3}{4}$	Cease	22.00
6	12 to 25	25 to 100	$2\frac{1}{2}$	1	Cedar	40.00
7	20 to 40	25 to 125	$2\frac{1}{2}$	$1\frac{1}{4}$	Ceiling	60.00
10	25 to 100	25 to 150	4	2	Celebrate	150.00

Larger diameters are desirable on discharge-pipes over 1,000 feet long.

PRICES, ETC., FIG. 77. WITH GLASS AIR-BARREL SAME CAPACITY AS CORRESPONDING SIZES IN IRON

Size	Cipher	Price
Number 2.....	Celemin	\$20.00
Number 3.....	Celeres	25.00

Hydraulic Ram

EXPLANATION



FIG. 77
IN OPERATION

The hydraulic ram must be set below the level of the supply, at a distance varying with the conditions under which it works. The water acquires a constantly increasing velocity in its downward course from the supply to the ram until it is suddenly stopped by the closing of the impetus valve, shown on the left of the illustration. Its only chance of escape is through the inside valve, which opens into the air-chamber; the air in this chamber is compressed by the blow sufficiently to allow a portion of the water to enter. (The size of this portion depends upon the fall from supply to ram, the height to which the water is to be elevated, the length of the drive-pipe, and the friction.)

The air immediately expands and recovers again its original volume. This action closes the inside valve and compels the excess of water to escape through the discharge-pipe, which has now become the only means of exit.

When the impetus valve rebounds, which it will always do if of proper weight, the water in the drive-pipe is again allowed to acquire velocity by wasting through the holes in the valve, the friction of the water again raises the valve, and the process is continued as before.

It is evident that the air-barrel must be air-tight and that proper relations must exist between the drive and the discharge-pipe so that the weight and velocity of the water in the drive-pipe may be sufficient to generate power to perform the work required. We append a table showing the efficiency of the various sizes of hydraulic rams under given conditions, and the proportions of drive and discharge usually employed.

Too great a fall will wear out the impetus valve. Generally speaking, a ram should not be used to lift water over 125 feet vertically.

A gate-valve is recommended on both the drive and the discharge-pipe to avoid the necessity of emptying them when cleaning or making repairs.

GENERAL INSTRUCTIONS FOR SETTING

Place the ram in a pit, or in a suitable housing, out of the way of frost. Provide an outlet, or drain, for the waste water.

Avoid all angles in the drive-pipe, and lay the discharge-pipe as straight as possible. Angles in the discharge-pipe increase the friction with consequent loss of efficiency.

The length of the drive-pipe should be about three-fourths of the vertical height from ram to point of discharge, or five times the vertical height from supply to ram.

Hydraulic Ram

GENERAL INSTRUCTIONS FOR SETTING—Continued

Provide a good strainer of ample size on the supply-pipe to guard against the entrance of foreign matter.

Before ordering the ram, determine accurately the amount of water per minute that can be supplied to the ram in the dryest season of the year; the amount desired to be obtained in twenty-four hours; the number of feet fall (vertically) that can be obtained between the supply and the ram; the vertical height to which the water is to be raised, and the probable length of the drive and discharge-pipes.

TABLE SHOWING PRACTICAL EFFICIENCY OF THE HYDRAULIC RAM

Minimum fall of water, in feet, under which ram will work effectively . . .	2	2	2	3	4	5	6	7	8	10	12
Vertical height in feet the water may be elevated	4	6	8	15	24	35	48	63	80	100	120
Length of Drive Pipe in feet	12	12	12	15	20	30	40	50	60	75	95
Relative height of Drive and Discharge	2 to 1	3 to 1	4 to 1	5 to 1	6 to 1	7 to 1	8 to 1	9 to 1	10 to 1	10 to 1	10 to 1
Proportion of water discharged by the ram	$\frac{2}{7}$	$\frac{1}{5}$	$\frac{1}{7}$	$\frac{2}{17}$	$\frac{1}{10}$	$\frac{1}{12}$	$\frac{1}{15}$	$\frac{2}{31}$	$\frac{1}{17}$	$\frac{1}{18}$	$\frac{1}{20}$
Proportion wasted at the Impetus Valve	$\frac{6}{7}$	$\frac{4}{5}$	$\frac{6}{7}$	$\frac{15}{17}$	$\frac{9}{10}$	$\frac{11}{12}$	$\frac{14}{15}$	$\frac{29}{31}$	$\frac{16}{17}$	$\frac{17}{18}$	$\frac{19}{20}$
Per cent. of useful effect of power expended	80	78	75	72	68	62	57	53	48	43	38

N. B. The hydraulic ram is most efficient when the volume of the air-chamber is equal to the volume of the discharge-pipe; therefore the larger size rams, when there is enough water, are best adapted for long discharge-pipes.

The cubical contents of the air-barrels to Fig. 77, also contents of various sizes of pipe per yard, are given below:

Air-barrels	Cubic Inches	Gallons	Pipe	Cubic Inches per Yard	Gallons per Yard
No. 2	130	.56	$\frac{3}{4}$ -inch	3.70	.016
No. 3	188	.81	$\frac{1}{2}$ -inch	6.93	.030
No. 4	289	1.25	$\frac{3}{4}$ -inch	15.59	.067
No. 5	577	2.50	1-inch	28.87	.125
No. 6	1213	5.25	1 $\frac{1}{4}$ -inch	43.20	.187
No. 7	1906	8.25	1 $\frac{1}{2}$ -inch	62.37	.270
No. 10	6468	28.00	2-inch	110.88	.480
. . . . .	. . . . .	. . . . .	2 $\frac{1}{2}$ -inch	173.25	.750
. . . . .	. . . . .	. . . . .	3-inch	249.48	1.080
. . . . .	. . . . .	. . . . .	3 $\frac{1}{2}$ -inch	339.57	1.470
. . . . .	. . . . .	. . . . .	4-inch	443.52	1.920

Hydrants, Etc.

Figure 396 has the brass screw controlling the piston at the bottom of the hydrant, out of the way of frost.

A check-valve is inserted below the seat, which closes when the piston is withdrawn for repacking, thus obviating the necessity for a corporation cock. The lower cylinder is brass lined, and is provided with a suitable drip-hole, which allows the hydrant to free itself of water when not in use.

Fitted for 2-inch iron pipe inlet and 2-inch New York hose outlet, unless otherwise ordered.

PRICE, FIG. 396

Any length up to four feet in ground \$25.00

FIG. 396

FIG. 405

CIPHER, FIG. 396

Length	Cipher	Length	Cipher
1 foot in ground	Dental	4 feet in ground	Dentist
1½ feet in ground	Dentary	4½ feet in ground	Dentistry
2 feet in ground	Dentate	5 feet in ground	Denude
2½ feet in ground	Dentation	6 feet in ground	Denunciate
3 feet in ground	Dented	7 feet in ground	Denyingly
3½ feet in ground	Dentexer	8 feet in ground	Deonerate

Fig. 405 is a telescopic curb box for corporation cocks. The lower shell is cast iron, the interior surface of which is ribbed to hold the extension-pipe at any height desired, and to keep it from turning while the cap is being unscrewed. The cap is brass bushed to prevent rusting together of threads. The rod has malleable connection to fit the handle of corporation cock.

When ordered in dozen lots, we will cast the dealer's name on the cap.

Regular length of inside pipe, 42 inches

PRICE, FIG. 405

Any length up to 62-inch pipe..... (Deserving).....\$3.00

Hydrants



FIG. 240

Figure 240 combines many valuable features. It has the movable waterway and pressure cup-packings of Murdock and Stacy, combined with the Douglas check-valve, which prevents the escape of water when the piston is withdrawn for repacking.

The check-valve, cylinder, piston, screw and spout are of cast brass. The waterway is large and clear, and the provision for waste to avoid freezing is ample.

Fig. 412 is similar in construction to Fig. 240, but with the top so modified as to make the hydrant self-closing. When closed, the lever stands upright in line with the cylinder, and not horizontal, as in some self-closing hydrants, where it is liable to be in the way. A catch on the side holds the hydrant open when desired.

When self-closing hydrants are to be used for pressures of over 50 pounds, it should be so stated in the order.

FIG. 412
SELF-CLOSING

PRICES, ETC., FIG. 240

To go in Ground	$\frac{3}{4}$ -inch Iron or Lead Pipe Inlet $\frac{3}{4}$ -inch Hose Outlet		1-inch Iron or Lead Pipe Inlet 1-inch Hose Outlet	
	Cipher	Price	Cipher	Price
1½ feet	Cooperage	\$9.25	Copperhead	\$11.75
2 feet	Cooperate	9.50	Coppering	12.00
2½ feet	Coordain	9.75	Copperize	12.25
3 feet	Coordinate	10.00	Coppery	12.50
3½ feet	Copal	10.25	Coppice	12.75
4 feet	Cope	10.50	Copple	13.00
4½ feet	Copestone	11.00	Copris	13.50
5 feet	Copia	11.50	Coptic	14.00
6 feet	Coping	12.50	Coptive	15.00
8 feet	Copist	14.50	Copular	17.00

PRICES, ETC., FIG. 412

To go in Ground	$\frac{3}{4}$ -inch		1-inch	
	Cipher	Price	Cipher	Price
3 feet	Devilet	\$11.50	Diadem	\$14.00
3½ feet	Devious	11.75	Diagnosis	14.25
4 feet	Devoid	12.00	Diagonal	14.50
5 feet	Devote	13.00	Dial	15.50
6 feet	Devout	14.00	Dialogue	16.50

Hydrants and Street Washers

Our "Economic" Hydrants, shown herewith, have the piston and screw actuating same combined in the lower cylinder, out of the way of frost.

The cylinder, piston, valve-stem and glands are of solid brass. The hydrant is provided with suitable waste to avoid freezing.

Fig. 375 and Fig. 402 are in all respects identical except that Fig. 402 has a jacket which adds to its stiffness and improves its appearance.

Fig. 380 is a street washer with valve like Fig. 375 and with suitable top to lie flush with the ground. As in Fig. 375, the operating screw is at the bottom, out of the reach of frost. The intermediate pipe is of galvanized iron.

Fig. 243 is constructed on the principle of our Fig. 240 hydrants, with movable roadway, etc. A check-valve, closing with the pressure, allows the plunger to be withdrawn for repacking without shutting off at corporation

cock. Figs. 380 and 243 will be furnished with dealer's name on cover when ordered in dozen lots.

PRICES, ETC., FIGS. 375 & 402. "ECONOMIC" HYDRANTS

To go in Ground	Figure 375				Figure 402			
	¾-inch		1-inch		¾-inch		1-inch	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
1½ ft.	Dancette	\$6.25	Darn	\$8.25	Deportment	\$7.25	Depulse	\$9.25
2 ft.	Dandelion	6.50	Darning	8.50	Deporture	7.50	Depulsion	9.50
3 ft.	Dandy	7.00	Dash	9.00	Depositor	8.00	Depute	10.00
3½ ft.	Danger	7.25	Dashing	9.25	Deposition	8.25	Deputy	10.25
4 ft.	Dangle	7.50	Dateless	9.50	Deprave	8.50	Derange	10.50
4½ ft.	Danite	7.75	Dative	9.75	Depravity	8.75	Derby	10.75
5 ft.	Dapple	8.00	Daubing	10.00	Deprecate	9.00	Derelict	11.00
5½ ft.	Dare	8.25	Daughter	10.25	Depress	9.25	Deride	11.25
6 ft.	Daring	8.50	Daunt	10.50	Depressed	9.50	Derision	11.50
8 ft.	Darken	9.50	Davenport	11.50	Deprive	10.50	Derivation	12.50

PRICES, ETC., FIGS. 380 & 243. STREET WASHERS

To go in Ground	Figure 380				Figure 243			
	¾-inch		1-inch		¾-inch		1-inch	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
1½ ft.	Dealt	\$6.25	Decease	\$8.25	Corked	\$7.25	Corneous	\$9.75
2 ft.	Deanery	6.50	Deceit	8.50	Corking	7.50	Corner	10.00
2½ ft.	Deanship	6.75	Decent	8.75	Corkscrew	7.75	Cornered	10.25
3 ft.	Debase	7.00	Deception	9.00	Cormorant	8.00	Cornering	10.50
3½ ft.	Debatable	7.25	Decern	9.25	Cormus	8.25	Cornerwise	10.75
4 ft.	Debate	7.50	Decimal	9.50	Corn	8.50	Cornet	11.00
4½ ft.	Debeature	7.75	Decimate	9.75	Cornage	9.00	Cornetoy	11.50
5 ft.	Debility	8.00	Decision	10.00	Cornbrash	9.50	Corneter	12.00
6 ft.	Decamp	8.50	Decking	10.50	Corneal	10.50	Cornice	13.00
8 ft.	Decanter	9.50	Declare	11.50	Cornelian	12.50	Cornish	15.00

Pressure Pumps

FOR PLUMBERS, ETC.



FIG. 334



FIG. 425



FIG. 134

Figure 334 is very strongly constructed, and is designed for pressures 600 pounds.

Fitted with knuckle joint to be connected with overhead countershaft when so ordered.

Not more than two or three feet vertical suction is recommended.

Fig. 425 is a brass plumbers' force pump with iron stirrup, for cleansing testing pipes by either suction or force. A conical tip, with thread the entire length, to adapt for any size pipe up to $1\frac{1}{4}$ inch, accompanies each pump.

Suction and discharge fitted for 1-inch hose. Cylinder—2-inch bore, 5-inch stroke; capacity, .07 gallons per stroke.

Fig. 134 is a brass, single-acting pump for clearing obstructions from pipes, etc.

PRICES, ETC., FIG. 334

Size	Diameter of Piston	Diameter Suction and Discharge Pipes	Cipher	Price
Number 0	1 -inch	$\frac{3}{4}$ -inch	Doctoress	\$12.00
Number 1	$1\frac{1}{4}$ -inch	1 -inch	Curable	25.00
Number 2	$1\frac{1}{2}$ -inch	1 -inch	Curate	30.00

PRICE, ETC., FIG. 425

As shown in cut (Disable) \$15.

PRICE, ETC., FIG. 134

As shown in cut (Clare) \$20.

Plumbers' Pumps

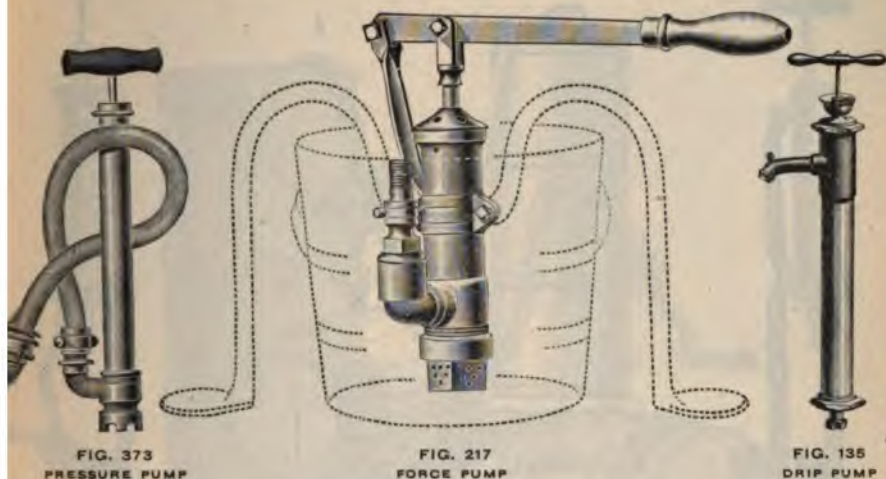


FIG. 373
PRESSURE PUMP

FIG. 217
FORCE PUMP

FIG. 135
DRIP PUMP

Figure 373 is a pressure pump constructed entirely of brass with wood handle-grip and three feet of discharge-hose.

In operation, the pump is used in a pail, or draws directly from the vessel in which it is at work.

The conical tip adapts the discharge for many sizes of pipe.

Diameter of cylinder, 1 inch.

Pressure limited, under average circumstances, to 75 pounds, by strength of operator.

Fig. 217 is a very compact force pump with side ears to adapt it for securing to a support, as outlined in the cut. The material is cast brass. Iron stirrup furnished when so ordered.

Bore of cylinder, 2 inches.

Fig. 135 is a drip pump for removing water from gas-pipes, etc.

It has brass cylinder, cylinder head, valve-seat, piston and rod. The spout section is of iron.

Suction fitted regularly for 1-inch iron pipe.

PRICES, ETC., FIGS. 373, 217 & 135

Style	Cipher	Price
Fig. 373, as in cut.....	Dampy	\$7.00
Fig. 217, as in cut.....	Congregate	10.00
Fig. 217, Nickel-plated, with bottom arranged for Suction-Pipe and Jamb Nut.....	Congreck	18.00
Fig. 135, as in cut.....	Clarence	12.00

Counter and Rotary Pumps



FIG. 355
COUNTER PUMP

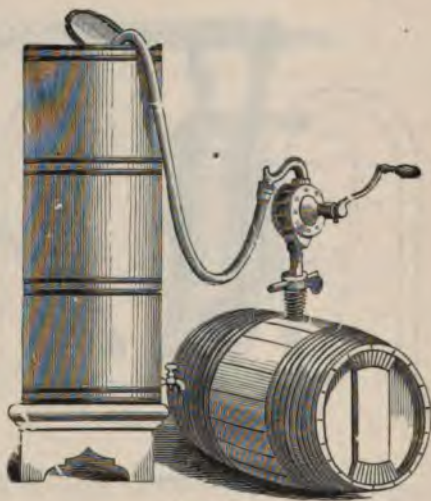


FIG. 109
ROTARY PUMP



FIGS. 146 & 193
COUNTER PUMP

Figure 355 is a light brass counter pump with cast-iron frame. The cylinder is of seamless brass tubing, 2 inches in diameter, and all parts traversed by the liquid are of brass. Suction and discharge are fitted regularly for $\frac{1}{2}$ -inch iron pipe, with coupling and tube for $\frac{3}{8}$ -inch lead pipe. Will be fitted for $\frac{3}{4}$ -inch iron pipe when so ordered.

Figure 109 is a rotary barrel pump, with sliding valves controlled by cams in each head. It is thus capable of being repaired more readily than many other styles of rotary pumps. Fig. 109 is extensively used for pumping oils and similar substances in factories or warehouses. The iron pump has brass valves.

All pumps are fitted with a conical barrel-holder. A hook pipe is supplied with each pump for use on the discharge-hose. Prices given below do not include hose.

Fig. 146 is a brass counter pump, with iron stirrup. The cylinder is 2-inch bore. Fitted regularly for $\frac{1}{2}$ -inch lead pipe suction and discharge.

Fig. 193 is like Fig. 146, but with cylinder of iron, porcelain-lined. The head is of galvanized iron.

PRICE, ETC., FIG. 355

As shown in cut..... (Cyclone)..... \$5.50

PRICES, ETC., FIG. 109 WITH SUCTION PIPE, BARREL HOLDER AND HOOK PIPE

Size	Diam. of Outside Cylinder	Length of 1-inch Suction Pipe	Gallons per Revolution	Disch. for Hose	Iron		Brass	
					Cipher	Price	Cipher	Price
No. 1	4 $\frac{1}{2}$ -inch	3 feet	.....	$\frac{1}{2}$ -inch	Chill	\$18.00	Chillish	\$42.00
No. 2	6 -inch	4 $\frac{1}{2}$ feet	.....	1-inch	Chilliness	25.00	Chilty	60.00

PRICES, ETC., FIGS. 146 & 193

Figure	Cipher	Price
Fig. 146, as shown in cut	Clasp	\$6.50
With Cock on Discharge	Clasping	7.50
Fig. 193, As shown in cut	Comet	5.00
With Cock on Discharge	Comeliness	6.00

Rotary Pumps



FIG. 287

Figure 287 is a geared pattern of Rotary Barrel Pump, with conical attachment for securing in the barrel, and hook pipe, shown at "A" in illustration, for discharge-hose into tank.

Particularly adapted for use with oils, etc. A check-valve keeps the pump constantly primed.

All the pumps listed below have 3 feet of wrought-iron suction-pipe. Brass or copper pipe supplied when so ordered, at lowest market rates. Discharge-hose furnished at reasonable prices.

PRICES, ETC., FIG. 287

WITH SUCTION PIPE, BARREL HOLDER AND HOOK PIPE

Size	Diam. Suction Pipe	Diam. Dis. Pipe	Gals. per Min. at 50 Revs.	Iron		Bronze Case and Gears		All Bronze in Contact with Liquid	
				Cipher	Price	Cipher	Price	Cipher	Price
No. 1	1 -inch	1 -inch	5½	Crispin	\$17.00	Criterion	\$39.00	Critically	\$49.00
No. 2	1 -inch	1 -inch	7½	Crispness	20.00	Critic	44.00	Criticave	54.00
No. 3	1¼-inch	1¼-inch	10	Crispy	24.00	Critical	49.00	Critiery	61.00

Rotary Pumps



FIG. 347
ON COLUMN



FIG. 348
ON FLANGE

Figure 347 is a geared rotary hand force pump on column as shown in cut. This is a very smoothly-working pump, and is recommended for general use where oil and similar substances are to be forced. A check-valve keeps the pump constantly primed. Suitable for pressures up to 25 pounds.

Fig. 348 is similar to Fig. 347, but has balance-wheel for hand or belt power, and a wide flange at base with provision for four bolts. In all other respects it is like Fig. 347.

PRICES, ETC., FIG. 347

Size	Suction Pipe	Discha'ge Pipe	Gals. per Min. at 50 Turns	Iron		Bronze Case and Gears		All Bronze in Con- tact with Liquid	
				Cipher	Price	Cipher	Price	Cipher	Price
No. 1	1½-inch	1 -inch	5½	Curraunt	\$20.00	Curse	\$42.00	Cursor	\$52.00
No. 2	1½-inch	1 -inch	7½	Curricke	23.00	Curseclly	47.00	Cursorary	57.00
No. 3	1½-inch	1½-inch	10	Currish	27.00	Cursing	52.00	Cursores	64.00
No. 4	1½-inch	1½-inch	12½	Currycomb	35.00	Cursive	65.00	Cursorial	87.00
No. 5	2 -inch	2 -inch	18	Currying	40.00	Cursively	75.00	Cursorious	105.00
No. 6	3 -inch	2½-inch	24	Currylit	50.00	Cursiveted	100.00	Curstable	140.00

PRICES, ETC., FIG. 348

Size	Suction Pipe	Discha'ge Pipe for Hose	Gals. per Min. at 50 Turns	Iron		Bronze Case and Cams		All Bronze in Con- tact with Liquid	
				Cipher	Price	Cipher	Price	Cipher	Price
No. 1	1½-inch	1 -inch	5½	Curt	\$19.50	Curtness	\$41.50	Curvedness	\$51.00
No. 2	1½-inch	1 -inch	7½	Curtail	22.50	Curtsy	46.50	Curvet	56.00
No. 3	1½-inch	1½-inch	10	Curtailer	26.75	Curvate	51.75	Curvetting	64.00
No. 4	1½-inch	1½-inch	12½	Curtain	36.50	Curvation	67.00	Curviform	89.00
No. 5	2 -inch	2 -inch	18	Curtly	42.00	Curvature	77.50	Curvital	107.00

Rotary Pumps



FIG. 267
ON COLUMN



FIG. 111
ON BASE

Figure 267 is one of our rotary pumps operated by cams in the heads, like our Fig. 109, on page 94.

A check-valve keeps the column of water up, and a suitable thumbscrew allows the water to run back to avoid freezing.

Inside diameter of shell, 6 inches. Suction-pipe, 1 $\frac{1}{4}$ -inch. Discharge, 1-inch hose. Maximum capacity per minute, 25 gallons.

Fig. 111 has internal construction similar to Fig. 267, but has both pulley and crank, as shown, and a different base. This pump has no check-valve, and we would recommend the use of our Fig. 113, page 148, in connection with it.

PRICES, ETC., FIG. 267

As shown in cut (Cozen) \$25.00
Extra for pulley balance-wheel 2.00

PRICES, ETC., FIG. 111. AS SHOWN IN CUT

Inside Diameter of Shell	Maximum Capacity per Minute	Suction Pipe	Discharge Hose	Pulley	Cipher	Price
5 $\frac{1}{2}$ inches	20 gallons	1-inch	1 -inch	3 x 12	Chime	\$22.00
8 $\frac{1}{4}$ inches	40 gallons	2-inch	1 $\frac{1}{4}$ -inch	3 x 12	Chimney	44.00

Rotary Pumps



FIG. 96



FIG. 349

Figure 96 is the same style of rotary as our Fig. 109 on page 94, but arranged with cricket and shaft, as shown in cut.

Fig. 349 is a geared rotary similar to Fig. 347 and 348, with bed and top pulleys, as shown in cut.

Pulleys on Nos. 1, 2 and 3 are $2\frac{1}{2} \times 7$; Nos. 4 and 5, 3×11 ; No. 6, 4×14 .

Adopted for working against 30 pounds pressure.

PRICES, ETC., FIG. 96

Size	Revs. per Minute	Gals. per Rev.	Suction and Discharge Pipe	Iron, Brass Valves		All Brass Pump except Shaft	
				Cipher	Price	Cipher	Price
5 $\frac{1}{2}$	20 to 150	.13	1-inch	Champagne	\$35.00	Champlain	\$63.00
8 $\frac{1}{2}$	20 to 120	.35	2-inch	Champion	60.00	Chance	130.00

PRICES, ETC., FIG. 349

No.	Suct'n Pipe	Disch. Pipe	Gallons per Min. at 100 Turns	All Iron		Bronze Case and Gears		All Bronze in Contact with Liquor	
				Cipher	Price	Cipher	Price	Cipher	Price
1	1 $\frac{1}{4}$	1	11	Cushion	\$27.00	Cutaway	\$49.00	Cuticulum	\$60.00
2	1 $\frac{1}{4}$	1	15	Cuss	32.00	Cute	56.00	Cutify	65.00
3	1 $\frac{1}{2}$	1 $\frac{1}{4}$	20	Cussed	38.00	Cutely	63.00	Cutikins	75.00
4	2	1 $\frac{1}{2}$	25	Custard	48.00	Cuteness	78.00	Cutin	100.00
5	2	2	36	Custody	54.00	Cuticle	90.00	Cutinize	120.00
6	3	2 $\frac{1}{2}$	48	Custos	80.00	Cuticula	135.00	Cutisector	175.00

Rotary Pump

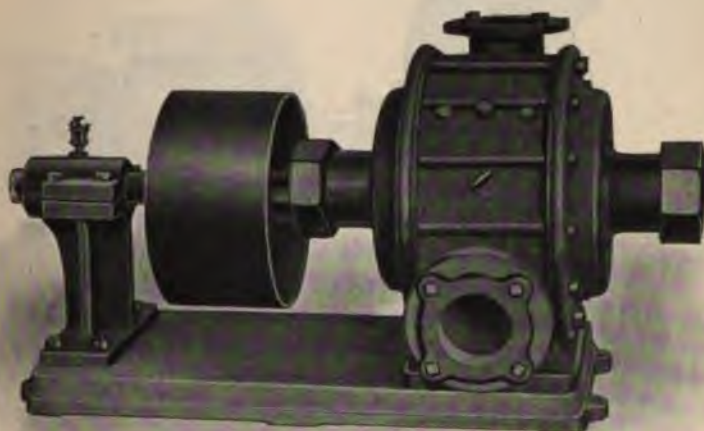


FIG. 97

Figure 97 pump consists of two cylinders, one within the other. The exterior cylinder has two heads, with cams on the inside, which cause the valves to slide in and out in the slots carried by the inside cylinder. Suitable passages in the valves maintain an equal pressure upon them, both inside and out. The valves do not move when loaded, but just before and just after doing their work.

Furnished with either one or two pulleys, any diameter up to 20 inches.

PRICES, Etc., FIG. 97

Diameter Outside Cylinder	Gallons per Rev.	Range of Speed per Minute	Diameter Suction and Discharge Pipes	Cipher	Price
12½ inches	1.3	20 to 100	2½ inches	Chancellor	\$150.00
16 inches	2.5	20 to 100	4 inches	Chancery	250.00

The higher speed is for occasional use only.

Horizontal Centrifugal Pu

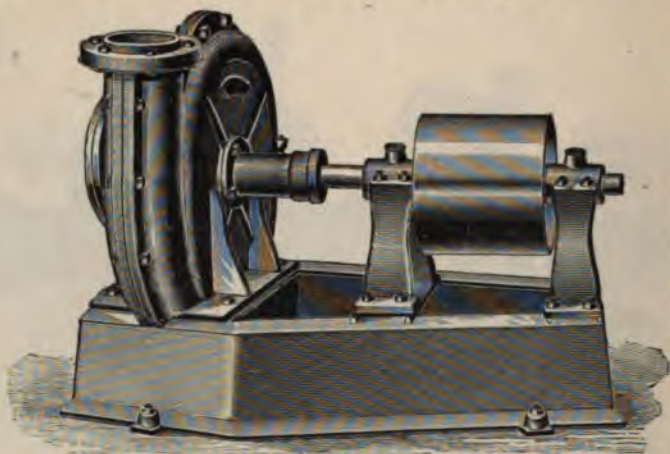


FIG. 390

Figure 390 is a horizontal centrifugal pump without primer. This pump can be set so that the water will flow into it, or else place a foot-valve at bottom of suction-pipe, in which case it may be set not more than 28 feet above the water level.

This pump, with check-valve at bottom of suction-pipe, is extensively used for irrigating and drainage purposes.

The pump shown above is right-handed, which will always be sent in that direction unless ordered otherwise.

In setting, be careful to bolt down evenly, so that the shaft will run true. Run in direction of scroll. Fill pump and suction-pipe with water before starting. When estimating the speed required, the vertical height of lift is the distance from the water to point of discharge.

Use discharge-pipe same size as the discharge opening. Use suction-pipe larger than diameter of pump. Keep stuffing-box well packed.

PRICES, ETC., FIG. 390

No.	Disch. Diam. Inches	Suction Diam. Inches	Iron		Brass		Appr Shipp in p
			Cipher	Price	Cipher	Price	
1½	1½	2	Degrease	\$35.00	Delible	\$65.00	
1¾	2	2	Degree	50.00	Delicacy	100.00	
2	2	2½	Deject	70.00	Delicate	125.00	
2½	2½	3	Dejected	80.00	Delice	150.00	
3	3	4	Dejection	95.00	Delicious	175.00	
3½	3½	5	Dejectory	110.00	Delient	230.00	
4	4	5	Delapse	130.00	Delight	275.00	
5	5	6	Delapsion	165.00	Delighted	350.00	
6	6	8	Delate	200.00	Delightful	410.00	
8	8	10	Delation	310.00	.....	.....	1
10	10	12	Delator	395.00	.....	.....	1
12	12	14	Delegate	500.00	.....	.....	1
15	15	18	Delegation	710.00	.....	.....	3
18	18	22	Deliberate	.....	.....	.....	6

For capacity, speed, etc., see table on page 103.

Horizontal Centrifugal Pump

WITH PRIMER

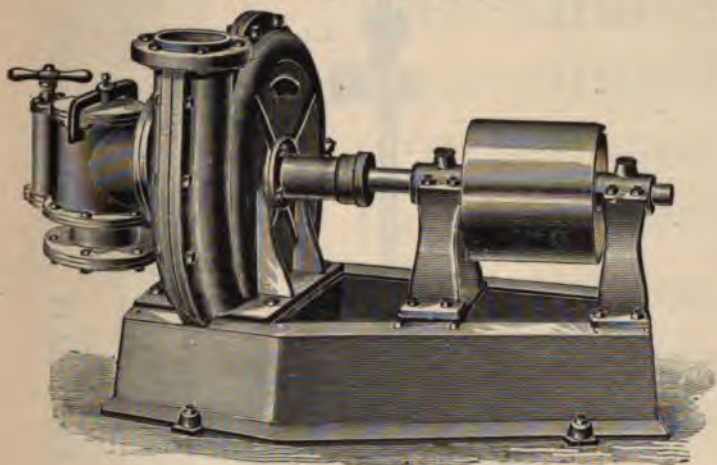


FIG. 391

Figure 391 is same as Fig. 390, with primer added. The primer contains only one valve, which can be got at by loosening the bolt in yoke of hand-hole plate. A foot-valve is recommended in addition to the primer.

Use suction-pipe a size or two larger than diameter of pump. Use discharge-pipe same diameter as discharge opening. Keep stuffing-box well packed.

Pump shown in cut is right-handed, and will be sent unless ordered otherwise.

PRICES, ETC., FIG. 391

No.	Disch. Diam. Inches	Suction Diam. Inches	Iron		Brass		Approximate Shipping Wt. in pounds
			Cipher	Price	Cipher	Price	
1½	1½	2	Delignate	\$45.00	Demay	\$80.00	150
1¾	2	2	Delimit	60.00	Demean	120.00	210
2	2	2½	Deline	85.00	Demember	150.00	350
2½	2½	3	Delineable	95.00	Demency	175.00	390
3	3	4	Delineate	110.00	Dement	210.00	420
3½	3½	5	Delinquent	135.00	Dementate	270.00	480
4	4	5	Delphin	155.00	Demented	330.00	540
5	5	6	Delta	195.00	Demerge	420.00	590
6	6	8	Delude	240.00	Demerit	495.00	1100
8	8	10	Delusion	375.00	.....	.....	1775
10	10	12	Delusive	470.00	.....	.....	1800
12	12	14	Delusory	600.00	.....	.....	2200
15	15	18	Demagogue	850.00	.....	.....	3800
18	18	22	Demark	.....	.....	.....	6500

For capacity, speed, etc., see table on page 103.

Vertical Centrifugal Pump

FOR SUBMERGED USE



FIG. 392

Figure 392 is a vertical centrifugal pump for submerged use. This pump should be installed at the bottom of the tank or pond from which it is to draw. It is not easily clogged by foreign matter, and is especially adapted to the emptying of vats, locks, excavations, etc., and for irrigation.

Give each leg a solid bearing, secure the shaft to suitable framework, and see that it does not bind. See that the collars at bearings and hub of pump carry the weight of the shaft and piston. Run the pump in the direction of scroll.

PRICES, ETC., FIG. 392

No.	Floor Space in Inches	Height from bottom of legs to center of Coupling, Inch.	Diameter of hole in Shaft Coupling	Iron		Approximate Shipping Wt. in pounds
				Cipher	Price	
1½	14 x 19	29½	1½	Demeter	\$30.00	70
1¾	18 x 22	30½	1½	Demit	40.00	120
2	24 x 24	34	1½	Democracy	60.00	190
2½	24 x 28	34½	1½	Demoeraph	70.00	230
3	24 x 28	34½	1½	Democrat	75.00	250
3½	26 x 30	40	1½	Demodex	95.00	375
4	29 x 32	40	1½	Demon	110.00	450
5	31 x 34	40½	1½	Demoniac	140.00	500
6	38 x 45	49	1¾	Demonist	170.00	750
8	48 x 54	61¼	2½	Denigrate	265.00	1200
10	58 x 66	68	2½	Denotable	330.00	1725
12	60 x 69	65	2½	Denotation	420.00	2200
15	72 x 72	83	3¼	Denounce	600.00	4400
18	88 x 94	75	4	Dense	950.00	5500

For table of capacities, speed, etc., see page 103.

For Centrifugal Pumps

TABLE OF DIAMETER OF PULLEYS AND DISCHARGE PIPES

Also Horse Power per foot lift and number of revolutions per minute necessary to raise water to different heights with the different sizes of VERTICAL AND SIDE SUCTION PUMPS

No. of Pump	Capacity Per Minute Gallons	Horse Power	Size of Dischg. Pipe in Inches	Suction Diameter	Pulleys, Inches	Face of Pulleys in Inches	REVOLUTIONS PER MINUTE													
							5 Ft.	10 Ft.	15 Ft.	20 Ft.	25 Ft.	30 Ft.	35 Ft.	40 Ft.	50 Ft.	60 Ft.	70 Ft.	80 Ft.	90 Ft.	100 Ft.
1 ¹ / ₂	75- 80	.032	1 ¹ / ₂	2	6	6	490	701	844	980	1095	1198	1295	1385	1548	1696	1832	1908	2076	2190
1 ¹ / ₄	95-125	.04	2	2	6	6	426	602	739	854	955	1045	1130	1215	1310	1478	1598	1708	1812	1910
2	140-160	.05	2	2 ¹ / ₂	7	8	330	468	572	662	740	810	874	942	1045	1145	1236	1322	1402	1478
2 ¹ / ₂	175-250	.085	2 ¹ / ₂	3	7	8	330	468	572	662	740	810	874	942	1045	1145	1236	1322	1402	1478
3	250-350	.126	3	4	7	8	330	468	572	662	740	810	874	942	1045	1145	1236	1322	1402	1478
3 ¹ / ₂	350-400	.190	3 ¹ / ₂	5	10	10	330	468	572	662	740	810	874	942	1045	1145	1236	1322	1402	1478
4	475-600	.270	4	5	10	10	285	400	485	560	625	700	755	810	900	1000	1060	1140	1225	1280
5	750-900	.420	5	6	10	10	285	400	485	560	625	700	755	810	900	1000	1060	1140	1225	1280
6	1200-1800	.525	6	8	12	12	215	300	370	426	485	522	564	610	677	745	792	861	942	968
8	2000-3000	1.35	8	10	15	12	171	242	286	342	382	418	452	486	540	592	638	684	724	764
10*	3000-4000	1.80	10	12	18	14*	160	226	278	328	358	392	424	456	506	555	598	640	680	716
10	3000-4000	1.80	10	12	24	14	120	170	206	238	266	291	315	340	376	412	446	476	505	534
12*	4000-5500	2.40	12	14	18	14*	171	242	286	342	382	418	452	486	540	592	638	684	724	764
12	4000-5500	2.40	12	14	20	14	150	212	262	302	336	370	398	430	476	522	564	602	640	674
15	8000-10000	4.30	15	18	30	18	116	164	202	232	260	285	308	332	370	402	436	466	494	522
18	12000-14000	6.80	18	24	..	..	100	140	170	198	220	242	260	280	312	342	370	395	418	442
22	20000-22000	9.65	22	26	..	..	70	98	120	140	155	170	182	198	220	240	258	276	300	310

* Low Lift Pump

Double-Acting Force Pump

SINGLE-ENDED



FIG. 236

Figure 236 is a double-acting force pump particularly adapted for use on shipboard as a "handy-billy," or in factories, tanneries, etc., for filling tanks. It is also particularly useful for spraying trees, in which case the pump can be used on the ground or in a wagon and the discharge-hose carried up a ladder.

For use with salt water, brass spring piston and metal valves should be added.

The cylinder is brass lined, and the rod, stuffing-box, valve-seats and couplings are of brass, also the nuts to head bolts. In the 5-inch and 6-inch sizes the valves are entirely of brass. All sizes are provided with suitable brass vent-plugs to avoid freezing. The valves are under the air-barrel, and can be got at by loosening the hinge bolts at each end of cylinder.

Each pump is mounted on beveled hard-wood plank, and provided with malleable iron brake having wooden handle grip.

Suitable for pressures of 30 pounds, or 60-foot lift from water to point of discharge. Extreme depth of suction-pipe, 25 feet.

FOR PRICES SEE NEXT PAGE

Double-Acting Force Pump

DOUBLE-ENDED



FIG. 257

Figure 257 is Fig. 236 (on page 104) arranged with double brakes.

PRICES, ETC., FIG. 236

Bore, Inches	Stroke in Inches	Diam. Suc'n Pipe, Inches	Discharge for Hose, Inches	Gallons per Revolution	Iron Brass-lined		Iron, Brass-lined, with Metal Valves and Spring Piston		All Brass, except Levers, etc., with Metal Valves and Spring Piston	
					Cipher	Price	Cipher	Price	Cipher	Price
2 1/2	4 1/2	1 1/4	1 1/4	.190	Converse	\$25.00	Convict	\$30.00	Convulsion	\$100.00
3	4 1/2	1 1/4	1 1/4	.260	Convert	28.00	Conviction	34.00	Convulsive	120.00
4	5 1/2	2	2	.598	Convex	30.00	Convinee	37.00	Cooked	130.00
5	5 1/2	2 1/4	2 1/4	.978	Conveyed	40.00	Convive	50.00	Cooking	160.00
6	6	3	2 1/2	1.468	Conveyance	50.00	Convoy	60.00	Cool	200.00

PRICES, ETC., FIG. 257

Bore, Inches	Stroke in Inches	Diam. Suc'n Pipe, Inches	Discharge for Hose, Inches	Gallons per Revolution	Iron, Brass-lined		Iron, Brass-lined with Metal Valves and Spring Piston		All Brass, except Levers, etc., with Metal Valves and Spring Piston	
					Cipher	Price	Cipher	Price	Cipher	Price
4	5 1/2	2	2	.570	Cottage	\$35.00	Cotton	\$42.00	Cottus	\$140.00
5	5 1/2	2 1/4	2 1/4	.892	Cotter	45.00	Cottonade	54.00	Cotula	170.00
6	5 1/2	2 1/2	2 1/2	1.224	Cottid	55.00	Cottonize	65.00	Couch	210.00

Double-Acting Force Pumps



FIG. 292



FIG. 305

Figure 292 is Fig. 236 (shown on page 104) mounted on wagon. The operator stands upon a step which acts as a brake on the wheels. The axles are malleable iron. The neap is of wrought iron. The plank is ash, well finished. This is a very serviceable form of portable pump for use in factories, tanneries, etc.

Fig. 305 is Fig. 292 with double-ended pump, as shown in cut.

PRICES, ETC., FIGS. 292 & 305

Style	Bore Inches	Stroke Inches	Gals. per Rev.	Suct'n for Iron Pipe	Disch. for Hose	Iron, Brass-lined	
						Cipher	Price
Figure 292.....	2½	4½	.190	1¼	1¼	Crocodile	\$40.00
	3	4¾	.260	1½	1¼	Croesus	45.00
	4	5½	.598	2	2	Croft	53.00
Figure 305.....	4	5¼	.570	2	2	Crowded	60.00
	5	5¼	.892	2½	2	Crowder	70.00
	6	5	1.224	3	2½	Crowdy	80.00

Double-Acting Force Pumps

FOR LIGHT SERVICE



FIG. 469
"HECTOR"



FIG. 465
"ROYAL"



FIG. 481
BRASS CYLINDER

Figure 469 is a lighter edition of our Fig. 236, shown on page 104. The arrangement of all the parts is similar to Fig. 236, and this pump will be found satisfactory in many places where severe work is not demanded.

The rod, stuffing-box and valve-seats are of cast brass. Suction and discharge fitted for $1\frac{1}{4}$ -inch pipe. If wanted for hose, remove the thread tubes.

Fig. 465 is a light-service tank pump of large capacity. The bore is 5 inches and stroke 5 inches. Suction threaded for $2\frac{1}{2}$ -inch American iron pipe, with gooseneck for 2-inch hose; can be supplied with brass thread tube for 2-inch pipe when so ordered. Discharge threaded for $2\frac{1}{2}$ -inch American iron pipe; discharge gooseneck threaded for 2-inch pipe, small gooseneck for 1-inch hose. Discharge can be fitted with brass thread tube for 2-inch or $1\frac{1}{2}$ -inch pipe in place of goosenecks, without extra charge.

A suction basket for 2-inch hose and a wood brake bar go with each pump.

This pump is very popular with threshermen, contractors and others, for filling tanks, etc. The upper valves are accessible by removing the valve caps on top of cylinder.

PRICES, ETC., FIG. 469

Bore	Stroke	Gals. per Stroke	Material	Cipher	Price
$2\frac{1}{2}$ -inch	5-inch	.106	Iron	Dowdy	\$16.00
$2\frac{1}{2}$ -inch	5-inch	.106	Iron, Brass-lined	Dowel	18.00
$2\frac{1}{2}$ -inch	5-inch	.106	Brass, with Spring Piston & Metal Valves	Downfall	64.00

PRICE, ETC., FIG. 465

As shown in cut (Dorcas) \$18.00

Any length of suction and discharge-hose furnished at market rates.

PRICE, ETC., FIG. 481

2 1-2 INCH BORE; 4 INCH STROKE

Suction and discharge for $1\frac{1}{4}$ -inch pipe (Dromedary) \$35.00

Double-Acting Force Pumps

FOR SPECIAL SERVICE

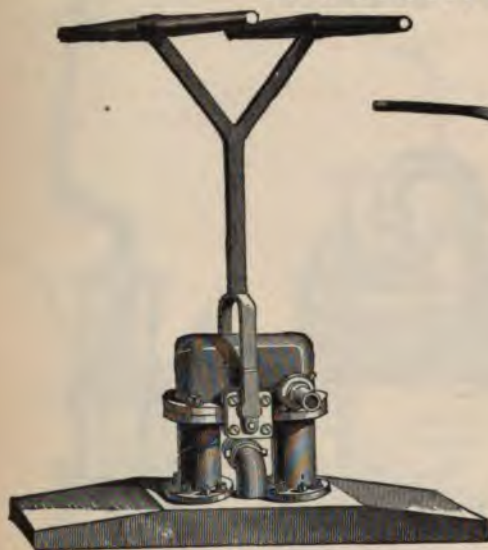


FIG. 133

Figure 133 is a brass ship pump, with two single-acting plungers. All parts in contact with the water are brass. The pump is mounted on a hard-wood base, as shown in cut. The brakes are malleable iron with wood handlebars.

Fig. 83 has all the valves under the bonnet shown in front, which can be removed by loosening only one nut. For this reason it is particularly desirable for use where it is necessary to clean the pump frequently of foreign matter, as when forcing liquid cement, etc.

Suction fitted for $1\frac{1}{2}$ -inch hose. Discharge fitted for $1\frac{1}{4}$ -inch hose.

We make the larger sizes of this pump like Fig. 107 on page 109.

PRICES, ETC., FIG. 133

Description	Cipher	Price
2½-inch Bore.....	Clanship	\$50.00
3 -inch Bore.....	Clansman	70.00
3½-inch Bore.....	Clapboard	90.00
4 -inch Bore.....	Clapper	110.00
4½-inch Bore.....	Clapping	130.00
6 -inch Bore.....	Claque	200.00

PRICES, ETC., FIG. 83

2 3-4 INCH BORE, 7 INCH STROKE. CAPACITY: .36 GALLONS PER REVOLUTION

	As Shown in Cut		With T Brake, like Fig. 107, Page 109	
	Cipher	Price	Cipher	Price
No. 1, Iron.....	Celestial	\$30.00	Celibatist	\$35.00
No. 1, Brass Cylinders	Celibate	40.00	Celibian	45.00
1, All Brass except brakes rods and air-barrel	Celibacy	76.00	Celine	81.00

Double-Acting Force Pump

FOR SPECIAL SERVICE



FIG. 107

Figure 107 has all the valves under one cap, held in place by one nut, as shown in cut. This construction makes it very easy to clean the valves with a pail of water after using, as is necessary when pumping liquid cement for grouting purposes. This pump is the only one in successful use for this purpose, and is much employed by builders of aqueducts, tunnels, etc.

Fig. 248 is Fig. 107 with wood bars in place of wrought-iron T brakes. The price is the same as No. 2, Fig. 107. This is the only size made Fig. 248 style.

Cipher, Fig. 248, Iron "Corrector"

" " " Brass cylinder "Corridor"

" " " Brass cylinder and base "Corrigible"

Suction Fig. 248, 2½-inch hose. Discharge, 2-inch hose.

PRICES, ETC., FIG. 107

No.	Bore in Inches	Stroke in Inches	Gallons per Revolution	Iron		Brass Cylinders		Brass Cylinders and Air-Barrel	
				Cipher	Price	Cipher	Price	Cipher	Price
1	2½	7	.36	Chiefrie	\$35.00	Childing	\$45.00	Chiliagon	\$81.00
2	4	7½	.81	Chieftain	60.00	Childish	120.00	Chiliarchy	160.00
3	5	9	1.53	Child	100.00	Childlike	165.00	Chiliasm	.....
4	6	9	2.20	Childhood	125.00	Children	196.00	Chiliastic	.....

Double - Acting Pumps

FOR SPECIAL SERVICE



FIG. 63



FIG. 247

Figure 63 has two single-acting cylinders, $4\frac{1}{2}$ inches diameter, and $9\frac{1}{2}$ -inch stroke. This pump is very desirable as a protection against fire.

The rods, stuffing-boxes and couplings are of cast brass. Fitted with removable wrought-iron T brakes. Suction, 3-inch iron pipe Discharge, 23-inch hose.

Fig. 247 is a bilge pump, arranged with wood bars, for use on vessels and similar duty. The brakes are rubber-cushioned. Cylinders, $5\frac{1}{2}$ -inch bore, 8-inch stroke. Capacity, $1\frac{8}{10}$ gallons per revolution. Suction fitted for 3-inch pipe. Sounding-plug on top of suction gooseneck.

PRICE, ETC., FIG. 63

As shown in cut..... (Caste) \$85.00

PRICES, ETC., FIG. 247

Material	Cipher	Price
All Iron.....	Corporator	\$60.00
Brass-lined Cylinders.....	Corposant	80.00
Copper-lined Cylinders.....	Corpulent	90.00
Copper-lined Cylinders and Galvanized Waterway at Discharge..	Corral	100.00

"Acme" Diaphragm Pumps



FIG. 376
BOTTOM SUCTION



FIG. 381
SIDE SUCTION

Figure 376 is our "Acme" Diaphragm Pump, which is particularly adapted for raising large quantities of water containing mud, drainage, grain or sanitary matter. There is no cylinder nor piston to wear by the introduction of foreign matter, and the diaphragm can be replaced, in an emergency, by a piece of canvas or an old coat. The valves carry rubber gaskets which work on iron valve-seats. A strong wrought-iron brake goes with every pump.

The top has two sets of lugs, so that the brake can be set either right- or left-handed.

Fig. 381 is similar to Fig. 376, but with square base and side—instead of bottom suction. Adapted for mounting on portable plank and using with suction-hose.

Attention is called to the fact that the numbers of our diaphragm pumps do not correspond with all other manufacturers. The capacity is measured by the diameter of the diaphragm, therefore our No. 2 size is the same as No. 3 of some makes.

PRICES, ETC., FIG. 376

Size	Diameter of Diaphragm	Gals. per Stroke	Diameter Suction Pipe	Cipher	Price
No. 1.....	9 inches	.75	2½ inches	Dawn	\$17.00
No. 2.....	12½ inches	1.50	3 inches	Day	20.00

PRICES, ETC., FIG. 381

Size	Diam. of Diaphm.	Gals. per Stroke	Diam. Suction Pipe	Suction Fitted with Nipple, Coupling and Tube for	Cipher	Price
No. 1	9	.75	2½	2½-inch N. Y. Hose	Declension	\$19.00
No. 2	12½	1.50	3	3 -inch N. Y. Hose	Decompose	24.00

Extra diaphragms and gaskets at reasonable rates. Suction-hose and fittings at short notice.

A suitable suction basket is shown by our Fig. 472, page 149.

Double-Acting Pumps

FOR SPECIAL SERVICE



FIG. 474



FIG. 203

Figure 474 consists of two diaphragm pumps, similar to those on previous page, incorporated with a crank-shaft and balance-wheels as shown. This arrangement many times increases the ease of operation and will be found particularly satisfactory on shipboard or for contractors' use.

The suction is fitted for 3-inch pipe, with nipple for 3-inch hose.

PRICE, ETC., FIG. 474

As shown in cut, without hose..... (Driftage)..... \$100.00

Fig. 203, known as "Railroad Force Pump," is double acting, with wood bars for use in filling tanks, or for fire use. For this pump arranged to work with wind-mill or other power, see Fig. 253, page 47.

The rod and stuffing-box are cast brass.

All the valves are accessible by removing the bonnet shown in front, without disturbing the pipes.

Furnished with top discharge when so ordered.

PRICES, ETC., FIG. 203

Bore Inches	Stroke Inches	Gallons per Stroke	Diam. Suction Pipe	Diam. Discharge Pipe	Iron		Brass-lined	
					Cipher	Price	Cipher	Price
3	8	.49	1½	1½	Compute	\$60.00	Comrade	\$63.50
4	8	.87	2	2	Computist	75.00	Comus	85.00

Deep Well Standards



FIG. 269



FIG. 250

Figure 269 has cast-iron column, with pulley balance-wheel 24 inches by 4 inches, adapted for hand or belt power.

The face-plate can be supplied for any stroke up to 6 inches. The bearing is babbitted and the rod and stuffing-box are of cast brass. The pitman is provided with suitable means to take up the wear.

Fig. 269 is adapted for a 3-inch working cylinder on lifts of 50 feet. Fitted for 2-inch inlet pipe and $1\frac{1}{2}$ -inch hose discharge, with 6-inch stroke unless otherwise ordered. The discharge can be fitted with air-barrel or with flange coupling for iron pipe, in place of spout, when so ordered.

Fig. 250 consists of cast-iron frame with cast-iron crank-shaft and cast gears. The ratio is $2\frac{3}{4}$ to 1.

We can furnish with pulley in place of balance-wheel, when so ordered, at reasonable charge.

PRICE, ETC., FIG. 269

As shown in cut (Crack) \$35.00

PRICES, ETC., FIG. 250. WITH BALANCE WHEEL

Size	Capacity	Cipher	Price
No. 3	3-inch Cylinder on 150-foot Lift.....	Corruptive	\$50.00
No. 6	3-inch Cylinder on 225-foot Lift.....	Corsair	90.00

For suitable working cylinders to the above see pages 51 to 57.

Deep Well Standard

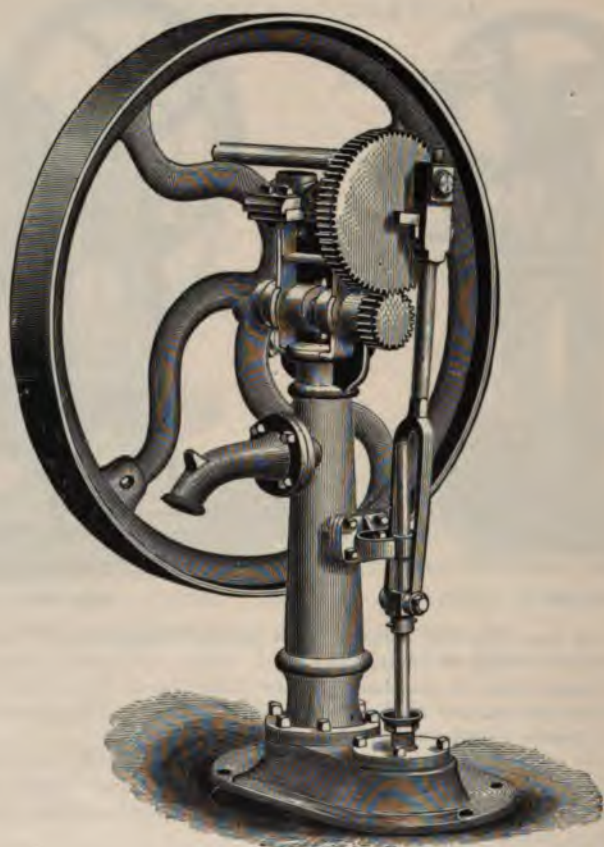


FIG. 386

Figure 386 has cast-iron column with steel shaft and machine-cut gears. The bearings are babbitted and all parts made in the most thorough manner. The rod is brass-covered and the stuffing-box of cast brass. The connecting-rod is provided with suitable strap-joint to take up wear. The pulley balance-wheel is 36 inches diameter and 4 inches face. Fitted for 2-inch iron pipe inlet and $1\frac{1}{2}$ -inch hose discharge unless otherwise ordered. Rod fitted for $\frac{3}{4}$ -inch pipe.

Suitable for 3-inch working cylinder on lifts of 75 feet.

PRICES, ETC., FIG. 386

Style	Cipher	Price
As Shown in Cut.....	Deflex	\$65.00
With Air-barrel on Discharge	Defluent	68.00
With Air-barrel and Cock	Deforest	70.00

For suitable working cylinders see pages 51 to 57.

Deep Well Working Head

WITH DIFFERENTIAL PLUNGER

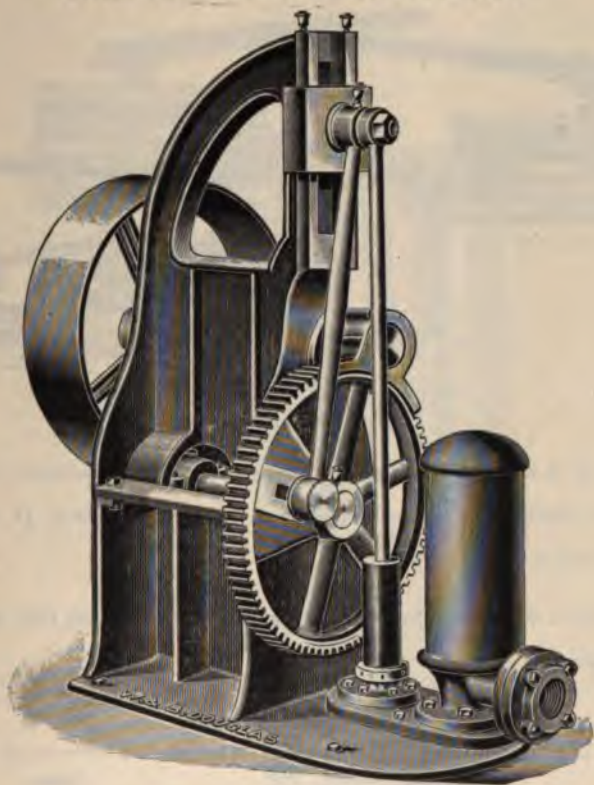


FIG. 473

Figure 473 is a new pattern of working head which is very substantially constructed. The gears are at the bottom, an arrangement which greatly increases the stability as well as diminishing the amount of head room required.

The base is so constructed that the pipe and rod can be withdrawn from the well without disturbing the frame.

For suitable working cylinders see Fig. 442, page 56.

PRICES, ETC., FIG. 473

Longest Stroke in Inches	Diameter Inlet Pipe in Inches	Diameter Outlet Pipe in Inches	Diameter Differential Plunger in Inches	Ratio of Gearing	Dimensions of Base in Inches	Height Above Floor, In.	Pulleys	Cipher	Price
10	4	2	2½	5 to 1	.....	..	..	Dressing	\$175.00
16	5	2½	3¼	5 to 1	38 x 23	69	..	Dribble	230.00

Horse Powers



FIG. 298



FIG. 394

Figure 298 is a single horse power for light service. Diameter of large gear, 30 inches, 91 teeth; small gear, $4\frac{1}{2}$ inches, 14 teeth. Frame, 38 inches long. Neap, 10 feet long.

Fig. 394 is a Fig. 236 pump (page 104) mounted on iron base with gearing for horse power.

PRICES, ETC., FIG. 298

Style	Cipher	Price
As Shown in Cut.....	Crossed	\$55.00
Same for Two Horses.....	Crossert	65.00

We can furnish heavier outfits if desired.

PRICES, ETC., FIG. 394

Diameter of Pump	Gallons per Rev.	Diam. Suction Pipe Inches	Diam. Disch. Pipe Inches	Style	Cipher	Price
5 inches	.78	$2\frac{1}{2}$	2	One-horse	Densely	\$150.00
5 inches	.78	$2\frac{1}{2}$	2	Two-horse	Denside	160.00
6 inches	1.30	3	$2\frac{1}{2}$	One-horse	Denseness	165.00
6 inches	1.30	3	$2\frac{1}{2}$	Two-horse	Densome	175.00

Horse Power for Deep Well

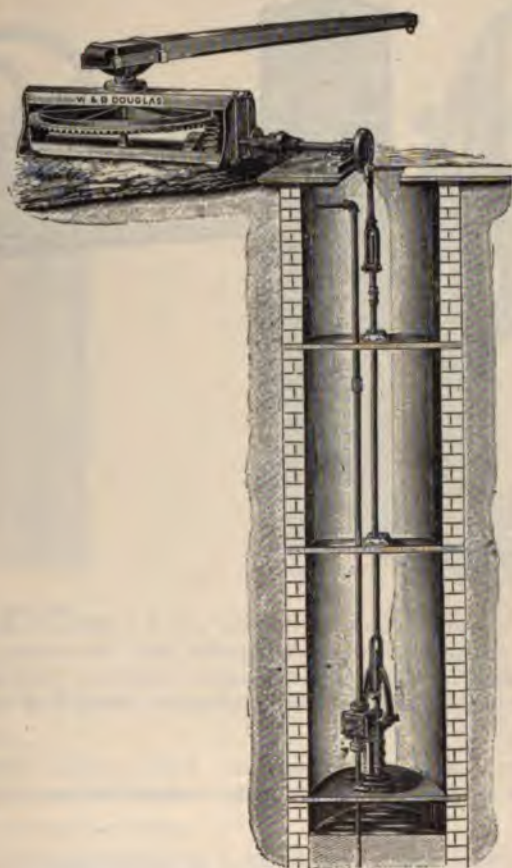


FIG. 359

Figure 359 shows an adaptation of our horse power to a deep well. In this illustration, the pump shown is our Fig. 253, page 47. For work of this kind, estimates will be furnished upon receipt of specifications. Be careful to state amount of water required, elevation to point of discharge, depth and diameter of well, and any other data affecting the case.

Correspondence is Solicited.

Air Pumps



FIG. 411



FIG. 200



FIG. 434

Figure 411 has seamless brass tube cylinder about 3 inches in diameter. The pump will stand all the power that can be applied with the hands, and has been tested to over 200 pounds pressure. It displaces about 35 cubic inches of free air per stroke and will be found very satisfactory for filling tires on bicycles or automobiles.

Fig. 200 is a brass air pump for hand use. Bore, 2 inches. Stroke, 6 inches. Displacement of free air per stroke, 18.85 cubic inches. Suitable for pressures up to 50 pounds.

Fig. 434 has seamless brass tube cylinder, 1 inch diameter and 12-inch stroke. The rod, head and check-valve are of brass. The base is of iron, adapted for holding with the feet, or screwing to the floor.

This pump, like Fig. 411, will stand all the pressure that can be applied with the hands.

PRICE, ETC., FIG. 411

With 3 feet Discharge-Hose and Nipple (Deduct) \$10.00

PRICE, ETC., FIG. 200

As shown in cut. (Complce) \$15.00

PRICE, ETC., FIG. 434

With 1½ feet Discharge-Hose and Nipple (Discomfit) \$3.00

Air Pumps



FIG. 293



FIG. 303

Figure 293 is Fig. 200 (on page 118) with crank-shaft and balance-wheel in place of lever.

Fig. 303 has iron cylinder, 4-inch bore, 8-inch stroke. Displacement, 100 cubic inches of free air per stroke.

Suitable for pressures up to 40 pounds per square inch.

PRICE, ETC., FIG. 293

As shown in cut.....(Croma).....\$28.00

PRICES, ETC., FIG. 303

Style	Cipher	Price
With Balance-wheel for hand use only	Crouched	\$50.00
With Pulley Balance-wheel, 24 x 4 inches	Croup	53.00
With Fast and Loose Pulleys, 24 x 4 inches.....	Crouping	57.00

Air Pump

FOR POWER

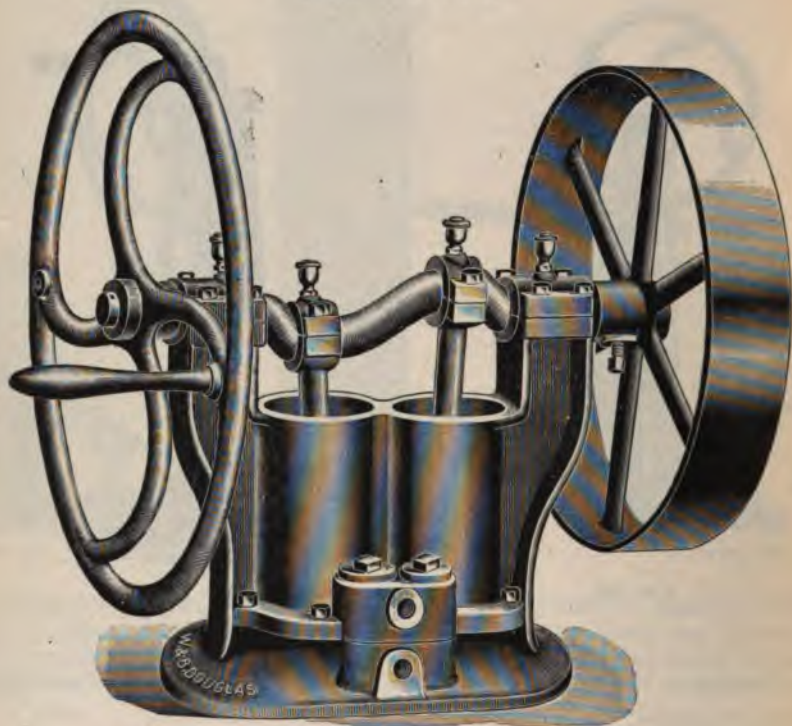


FIG. 475

Figure 475 has two cylinders, $4\frac{1}{2}$ inches diameter and 3-inch stroke. Capacity, 95 cubic inches of free air per revolution. Pressure, compatible with continuous service, 30 pounds. Pulley, 20 inches diameter, 3-inch face. Balance-wheel, 26 inches diameter. All bearings and pitman heads babbitted. Discharge fitted for 1-inch pipe or hose.

Base, 12x18 inches; height, 28 inches to top of balance-wheel; 100 revolutions per minute under 30-pound load.

PRICE, ETC., FIG. 475

As shown in cut..... (Driftweed) \$60.00

Air Pump

FOR POWER

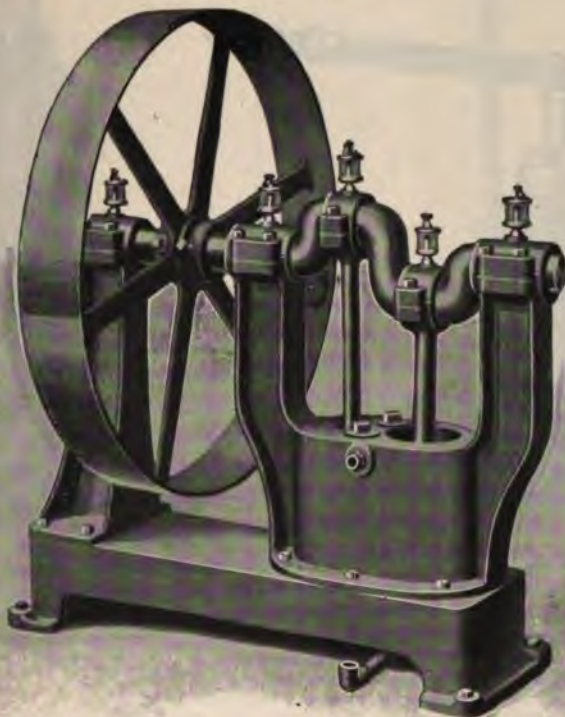


FIG. 466

Figure 466 is a two-stage air compressor with cylinders 5 and $2\frac{1}{2}$ inches diameter respectively and 5-inch stroke. The cylinders are water-jacketed, with connections for 1-inch iron pipe. Capacity, 98 cubic inches of free air per stroke. Fig. 466 can be run continuously at 100 revolutions per minute, against a pressure of 100 pounds.

Pulley, 36 inches diameter, 4-inch face. Base, 14×42 inches. Height to top of pulley, about 48 inches. Discharge fitted for 1-inch pipe or hose.

All bearings and strap-joints babbitted.

PRICE, ETC., FIG. 466

As shown in cut (Dorking) \$150.00

Boiler Pumps

FOR HAND USE

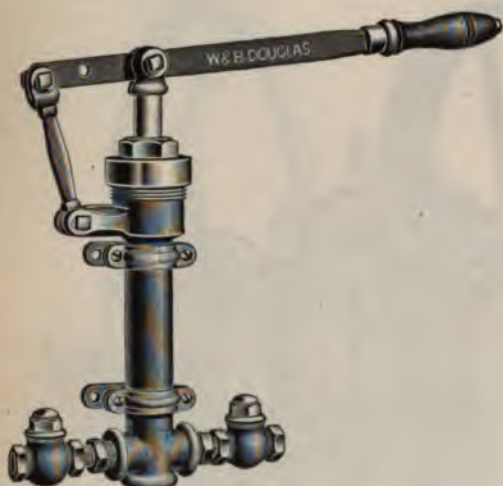


FIG. 451



FIG. 208

Figure 451 is a small boiler test, or feed pump. The plunger is solid iron, with brass stuffing-box and brass globe valves. The handle is of wrought iron, with wooden grip. This pump is not designed for a long suction-pipe, but should be placed as near the water as possible. Not over 3 feet vertical suction lift is recommended.

Fig. 451 will withstand all the pressure that can be applied with the hands, and can be tested up to 600 pounds. Weight, 12 pounds.

Side-eared style furnished unless otherwise ordered.

Fig. 208 is a hand boiler force pump with $2\frac{1}{2}$ -inch bore, 5-inch stroke; capacity per stroke, $\frac{1}{8}$ gal. Fitted for $1\frac{1}{4}$ -inch suction and discharge-pipes.

Fitted with metal valves throughout, and globe check-valve on discharge. Can be used for either hot or cold water. When used with hot water use as short suction-pipe as possible, for the vapor rising from the water destroys the vacuum. Side-eared style furnished unless otherwise ordered.

PRICES, ETC., FIG. 451

Style	Diameter Plunger	Stroke Inches	Gallons per Stroke	Suction and Discharge Fitted for	Cipher	Price
Side-eared, as in cut ..	1 inch	4	.014	$\frac{3}{4}$ -inch pipe	Doctor	\$12.00
With Base like Fig. 334	1 inch	4	.014	$\frac{3}{4}$ -inch pipe	Doctoress	12.00

PRICES, ETC., FIG. 208

Style	Cipher	Price
On Plank, as shown in cut	Concur	\$14.00
On Base, like Fig. 12, page 62	Concurrent	14.00

Boiler Pumps

FOR POWER



FIG. 175



FIG. 191

Figure 175 is a power boiler pump for pressures up to 50 pounds. The plunger, valve-seats, poppets and valve-bonnets are of brass. The shaft-bearing is babbitted. A handle is provided for hand use.

Fig. 191 is the pump part of Fig. 175, with rod threaded for jamb nuts.

Fig. 263, on page 125, is suitable for use with Fig. 191.

PRICES, ETC., FIG. 175

No.	Bore	Stroke	Gals. per Stroke	Fitted for Pipe	Size of Pulley	With One Pulley as in Cut		With Fast and Loose Pulleys	
						Cipher	Price	Cipher	Price
2	2	3	.041	1	2½ x 18	Cockerel	\$30.00	Cocoa	\$34.00
3	2½	6	.128	1½	4½ x 24	Cockeye	70.00	Cocoanut	75.00
4	3	6	.184	1½	4½ x 24	Cockney	75.00	Cocoon	85.00

PRICES, ETC., FIG. 191

Size	Cipher	Price
No. 2.....	Comatose	\$18.00
No. 3.....	Comb	30.00
No. 4.....	Combat	40.00

Boiler Pump

FOR POWER

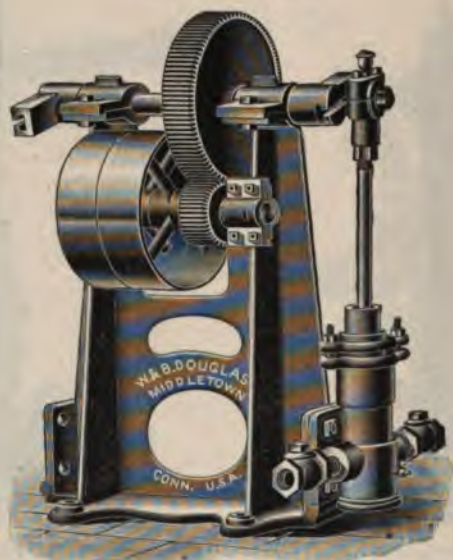


FIG. 462

Figure 462 is a very serviceable form of boiler feed pump on iron frame, with either one or two cylinders, as required. The wrist-pin can be adjusted for any stroke from 3 to 6 inches. The plunger is brass and also the globe valves. The bearings are babbitted and the gears machine-cut.

The single pump is adapted for 10 to 75-horse-power boilers and the double pump from 50 to 150-horse.

Diameter of cylinder, 3 inches; stroke, 6 inches; pulleys, 12x3 inches. Geared 3 to 1. Limit of pressure, 60 pounds.

Floor space single pump, 15x26 inches. Height to top of gear, 38 inches.

PRICES, ETC., FIG. 462

Style	Cipher	Price
Single Pump.....	Doorway	\$80.00
Double Pump	Dooryard	100.00

Countershafts



FIG. 299



FIG. 263

Figure 299 is a countershaft with face-plate for operating the lighter styles of force pumps and working cylinders. The hard-wood plank shown in cut accompanies each countershaft.

State stroke desired when ordering.

Fig. 263 is a back-gear countershaft. State stroke desired when ordering, also class of work to be performed. The rod is regularly left plain for welding, but can be fitted for any desired thread, when ordered.

The bearings are babbitted and the rod is provided with suitable strap-joint to take up the wear.

Will be sent with oil-holes and studs for overhead use as shown in cut, unless ordered to set on floor, in which case cap-screws will be used on the bearings.

Figs. 253, 291, 289, 191, or any of our working cylinders, pages 51 to 57, can be used with Fig. 263.

PRICES, ETC., FIG. 299

Pulleys	Cipher	Price
12 x 3 inches,	Crossing	\$25.00
20 x 3 inches,	Crossness	35.00

PRICES, ETC., FIG. 263

Size	Ratio of Gears	Pulleys	Cipher	Price
Small Frame	2½ to 1	14 x 4	Courant	\$50.00
Large Frame	5½ to 1	24 x 5	Coursed	100.00

Horizontal Power Pump

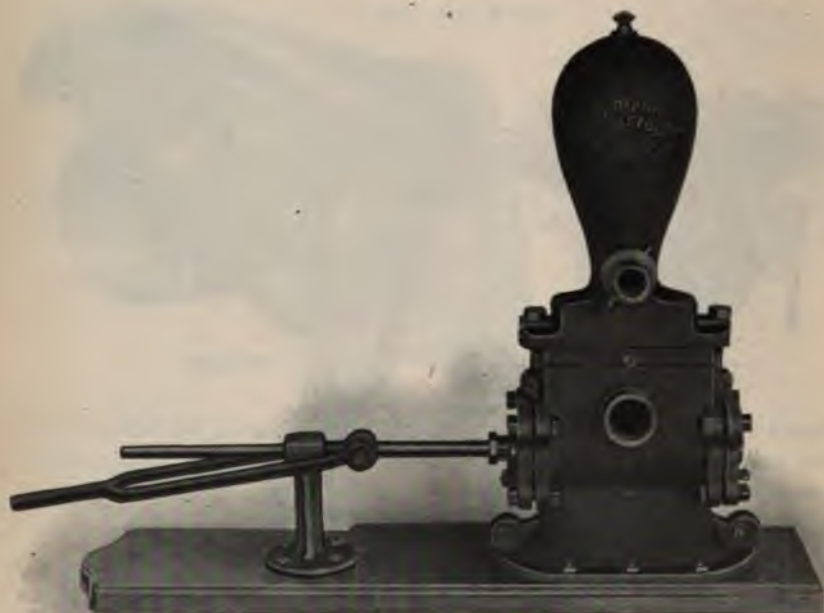


FIG. 482

Figure 482 is an adaptation of our well-known horizontal force pump, Fig. 236, with connecting-rod to weld to pitman from countershaft or water-wheel.

The valve-seats, piston-rod, and stuffing-box are of cast brass. The valves are under the air-barrel. The cylinders are brass-lined.

We can furnish this pump with spring piston and metal valves at reasonable additional charge.

PRICES, ETC., FIG. 482

Bore Inches	Stroke Inches	Gallons per Stroke	Diameter Suction Pipe	Diameter Discharge Hose	Cipher	Price
2½	4½	.191	1¼ inches	1¼ inches	Clang	\$28.00
3	4½	.260	1½ inches	1¼ inches	Clanglet	30.00
4	5½	.600	2 inches	2 inches	Clangted	32.00
5	5½	.930	2½ inches	2 inches	Clanking	50.00
6	6	1.469	3 inches	2½ inches	Clannish	55.00

Power Pumps



FIG. 218



FIG. 266

Figure 218 has a differential plunger, making it a very smooth running pump. It is a cheap and effective force pump for light service. It can be used on pressures of not over 20 pounds, at about 40 turns per minute.

Both sizes are provided with 3x16-inch pulley, with crank for hand use. Two wrought-iron braces, not shown in cut, accompany each pump.

Fig. 266 is a covered crank power force pump, with air-barrel combined. For pressures, or equivalent lifts of not over 25 pounds, this pump will be found very efficient. For use on farms, with gas engines, also in creameries, this pump is much employed. Both sizes of Fig. 266 are supplied with 3x16-inch pulleys.

PRICES, ETC., FIG. 218

Size	Bore Inches	Stroke Inches	Gallons per Rev.	Diam. Suction Pipe	Diam. Disch. Pipe	Material	Cipher	Price
No. 2.....	2½	5¼	.111	1¼	1¼	Iron	Congress	\$20.00
No. 2.....	2½	5¼	.111	1¼	1¼	Brass	Congy	40.00
No. 6.....	3½	5¼	.235	2	1½	Iron	Congreve	25.00
No. 6.....	3½	5¼	.235	2	1½	Brass	Conic	55.00

PRICES, ETC., FIG. 266

Bore Inches	Strk. Inch.	Gallons per Stroke	Diam. Suct'n Pipe	Diam. Disch. Pipe	Material	Pulleys	Cipher	Price
3	6	.184	1½	1¼	Iron	1	Cowpox	\$25.00
3	6	.184	1½	1¼	Iron	2	Cowslip	30.00
3	6	.184	1½	1¼	Brass-lined Cylinder	1	Coxal	32.00
4	6	.326	2	1½	Iron	1	Cowry	32.00
4	6	.326	2	1½	Iron	2	Cowstone	37.00
4	6	.326	2	1½	Brass-lined Cylinder	1	Coxcomb	40.00
3	6	....	1½	1¼	Iron, Upper Section For Set-Length	1	Coyish	\$25.00
4	6	....	2	1½	Iron, Upper Section For Set-Length	1	Coyness	32.00

Lower working cylinders for set-length are charged extra and should not be less than 12 inches long. See pages 51 to 57.

Power Pumps



FIG. 45. SINGLE

Figure 45 is our Fig. 26 double-acting "A" pump, page 69, mounted on iron column with face-plate and two pulleys. Suitable for pressures or equivalent lifts up to 30 pounds.

Fig. 46 is like Fig. 45, but with two double-acting pumps instead of one.

For metal valves see page 70.



FIG. 46. DOUBLE

PRICES, ETC., FIG. 45

No.	Iron		Iron, with Air-barrel		Brass Pumps		Brass Pumps, with Iron Air-barrels	
	Cipher	Price	Cipher	Price	Cipher	Price	Cipher	Price
1	Captive	\$65.00	Caramelize	\$68.00	Carat	\$78.00	Carbonator	\$81.00
2	Captivity	70.00	Caramote	75.00	Caravan	84.00	Carbonidae	89.00
3	Captor	75.00	Carangid	80.00	Caraway	94.00	Carbonised	99.00
4	Captorial	80.00	Carangidae	85.00	Carbine	101.00	Carbonizer	105.00
5	Capture	84.00	Carangine	92.00	Carbineer	118.00	Carbonous	127.00
6	Capucine	90.00	Carangoid	100.00	Carbolic	134.00	Carbonpy	144.00
8	Capulet	105.00	Caranna	120.00	Carbon	157.00	Carbonqua	172.00
10	Caramel	125.00	Caranto	140.00	Carbonate	209.00	Carboxyl	224.00

PRICES, ETC., FIG. 46

1	Carboy	\$75.00	Carding	\$81.00	Care	101.00	Caressing	107.00
2	Carbuncle	85.00	Cardiocele	95.00	Careen	113.00	Caret	123.00
3	Carburet	90.00	Cardiogmus	100.00	Careering	128.00	Caretaker	138.00
4	Carbyl	100.00	Cardiogram	110.00	Careful	142.00	Careyne	152.00
5	Carcase	108.00	Cardioid	124.00	Carefully	176.00	Carfax	192.00
6	Cardamon	120.00	Carditis	140.00	Careless	208.00	Carfoukes	228.00
8	Carder	145.00	Cardium	175.00	Carelessly	259.00	Carfuffle	289.00
10	Cardinal	175.00	Cardoon	205.00	Caressed	343.00	Cargazon	373.00

SIZES, CAPACITY, ETC., FIGS. 45 & 46

No.	Bore Inches	Stroke Inches	Fitted for Pipe	Pulleys	Gallons per Revolution	
					Fig. 45	Fig. 46
1	2 $\frac{1}{4}$	4 $\frac{1}{4}$	1 -inch	4 x 19	.163	.326
2	2 $\frac{1}{2}$	5 $\frac{1}{4}$	1 $\frac{1}{4}$ -inch	4 x 19	.223	.446
3	2 $\frac{3}{4}$	6	1 $\frac{3}{4}$ -inch	4 x 19	.309	.618
4	3	6 $\frac{3}{4}$	1 $\frac{1}{2}$ -inch	4 x 19	.412	.824
5	3 $\frac{1}{4}$	6 $\frac{1}{4}$	1 $\frac{1}{2}$ -inch	4 x 19	.485	.970
6	3 $\frac{1}{2}$	8	2 -inch	4 x 19	.666	1.332
8	4	8	2 -inch	4 $\frac{1}{2}$ x 20	.870	1.740
10	4 $\frac{1}{2}$	10	2 $\frac{1}{2}$ -inch	4 $\frac{1}{2}$ x 20	1.377	2.754

"Little Giant" Power Pump

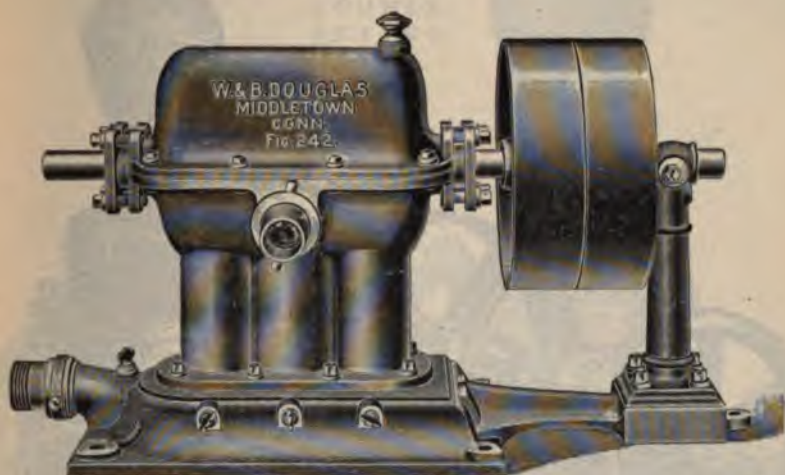


FIG. 242

Figure 242 has three single-acting cylinders with a cast-steel crank-shaft. The bearings are of brass, also the valves and pitmen. The working parts are easily accessible by loosening the brass cap-screws which secure the air-barrel to the cylinder. For pressures of 20 pounds or equivalent lifts, Fig. 242 will be found very satisfactory, and should run about 40 turns per minute for continuous service. In emergencies 100 turns can be employed.

PRICES, ETC., FIG. 242

Bore Inches	Stroke Inches	Gallons per Rev.	Diam. Suction Pipe	Diam. Discharge Pipe	Pulleys	Cipher	Price
3	2½	.228	2	1½	12 x 3 inches	Corinth	\$55.00
4	5	.816	2½	2	19 x 4 inches	Coris	150.00

Horizontal Power Pump

DOUBLE - ACTING



FIG. 435

Figure 435 is a double-acting horizontal power pump, with inside-packed piston, suitable for pressures up to 50 pounds, or lifts of 100 feet. Extreme depth of suction-pipe, 25 feet. The valves are under the cap on top of the cylinder; the rod and stuffing-box are of cast brass, also the gibbs, or crosshead bearings. The gears are machine-cut and the shaft bearings are all babbitted. The pitman has brass boxes with suitable provision for taking up the wear. The cylinder is brass-lined. For continuous service at 50 pounds pressure 35 strokes per minute are recommended.

PRICES, ETC., FIG. 435

Bore Inches	Stroke Inches	Gallons per Rev.	Suction Pipe	Disch. Pipe	Pulleys	Geared	Cipher	Price
3	5	.306	1½	1¼	18 x 3	4 to 1	Discomfort	\$125.00
4	5	.544	2	1½	18 x 3	4 to 1	Discommend	135.00
5	5	.850	2½	2	18 x 3	4 to 1	Discommon	160.00
6	6	1.468	3	2½	20 x 5	4 to 1	Discompose	250.00
8	8	3.482	4	3	20 x 5	5 to 1	Disconcert	400.00

Duplex Horizontal Power Pump

DOUBLE
ACTING

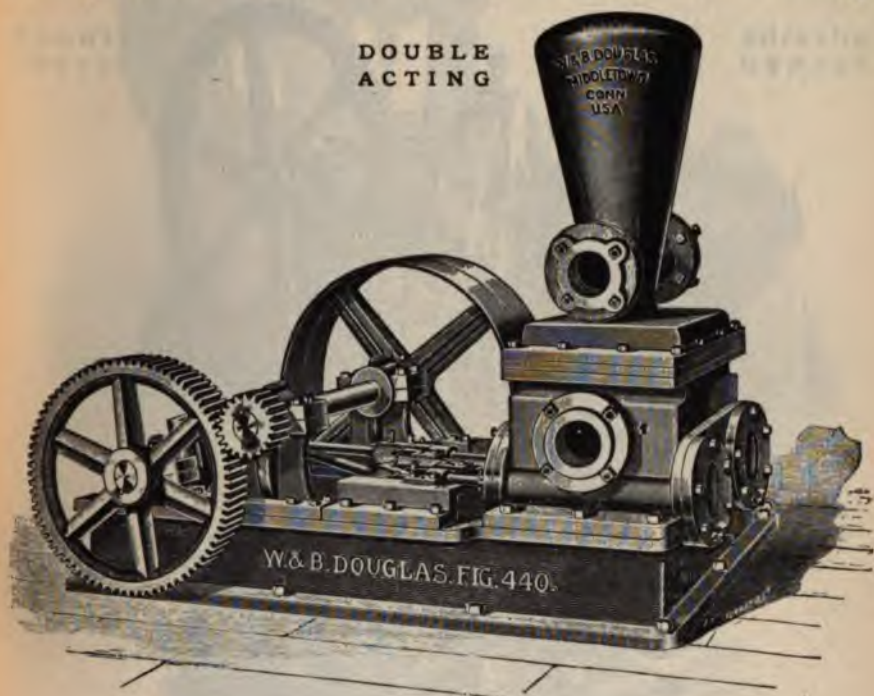


FIG. 440

Figure 440 is of similar construction to Fig. 435 shown on page 130 with two double-acting cylinders instead of one. The cylinders are brass-lined and the valves, piston-rod, stuffing-boxes and crosshead gibbs are of brass; also brass strap-joints on pitman. The gears are machine-cut and the shaft bearings are babbitted.

Fig. 440 will be found particularly serviceable in supplying water for tanks in factories and similar work, where the pressure is not over 50 pounds.

Specifications, Fig. 440

4-inch bore; 5-inch stroke; capacity, 1.088 gallons per revolution of crank-shaft; suction, 3-inch; discharge, 2½-inch; geared, 4 to 1; pulleys, 20 x 5.

PRICE, ETC., FIG. 440

As shown in cut,..... (Discreet)\$250.00

Triplex Power Pump

OUTSIDE
PACKED

SINGLE
ACTING

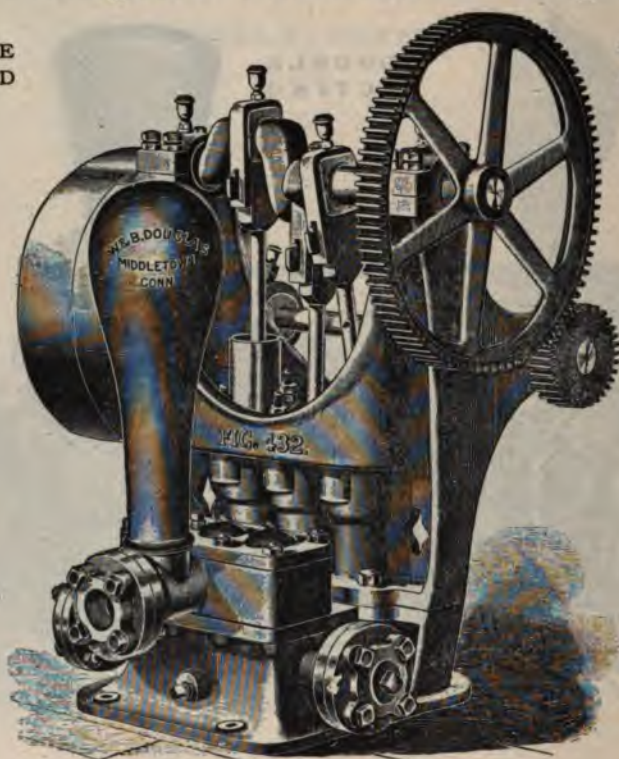


FIG. 432

Figure 432 is a three-cylinder, single-acting power pump for pressures up to 150 pounds, or lifts of 300 feet. Extreme depth of suction-pipe, 10 feet.

Regular construction of 2 and 3-inch pumps includes brass plungers and brass glands; above 3-inch diameter the plungers and glands are of iron. All sizes have metal valves, unless otherwise ordered. All gears are machine-cut, bearings babbitted, and pitman provided with suitable device for taking up wear. Fibre or rawhide pinions furnished when ordered, at reasonable charge.

For use in Paper Mills, Refrigerating Plants, Breweries, Boiler Feeding, Hydraulic Elevators, Mines, Water Works, etc., this type of pump is universally popular.

PRICES, ETC., FIG. 432

Diam. of Cylinders	Stroke in Inches	Gallons per Revolution	Suction in Inches	Discharge Inches	Ratio of Gearing	Pulleys	R. P. M. Crank Shaft		Approx. Weight in Pounds	Cipher	Price
							For 200 ft. Lift	For 300 ft. Lift			
2	3	1	1 1/2	1 1/2	On all sizes 5 to 1	12 x 2 1/2	50	40	235	Discamp	\$100.00
3	4	1 1/2	2 1/2	2 1/2		16 x 3	45	40	500	Discode	140.00
4	4	2	3 1/2	3 1/2		20 x 3	45	35	750	Discern	200.00
4	6	1	2 1/2	2		20 x 3	45	30	800	Dischurch	250.00
4	8	1 1/2	3 1/2	3 1/2		20 x 3	45	30	900	Disciple	275.00
5	6	1 1/2	3 1/2	3 1/2		26 x 4	40	30	1600	Discipline	330.00
5	8	2	3	2 1/2	On all sizes 5 to 1	26 x 4	40	30	1800	Disclaim	375.00
8	8	5 1/2	5	4		36 x 6	35	25	5800	Disclosure	700.00
8	10	6 1/2	5	4		36 x 6	35	25	6750	Discloud	900.00

Electric Triplex Pumps

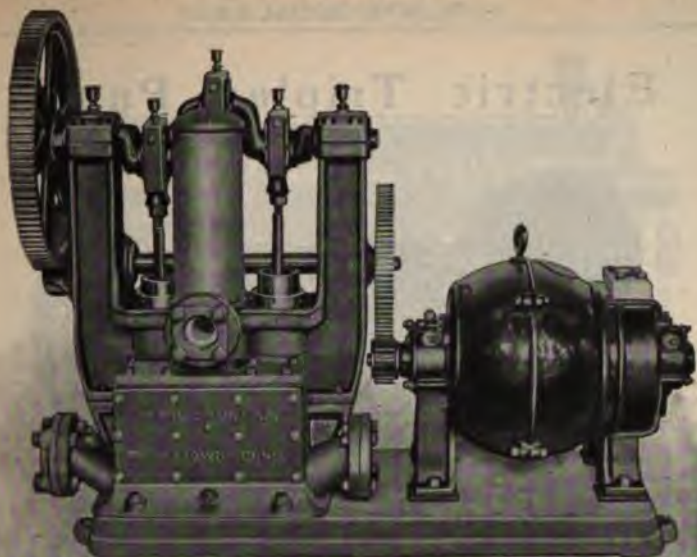


FIG. 479



FIG. 480

PRICES ON APPLICATION

Electric Triplex Pump

DIRECT CONNECTED



FIG. 468

Figure 468, Douglas Direct-connected Electric Pump, is a pumping apparatus consisting of a three-cylinder reciprocating pump connected to and operated from the motor by a simple, practical and noiseless worm gear transmitter. This combination is extensively employed to maintain a supply of water for domestic use, apartment houses, hotels, office buildings, tenements, factories, for operating hydraulic elevators, and in fact for any service where it is desired to elevate or move water or other clear liquids.

That this electric outfit is the most satisfactory to the user can be readily demonstrated by the following important facts:

It is simple in construction and free from all complication of belts, idler pulleys, noisy gearing, and other unreliable and unsatisfactory devices. It is durable and not liable to derangement and lends itself readily to automatic regulation. It runs noiselessly, throwing a steady stream of water without hammer or pulsation, and is therefore particularly desirable in private apartment houses and hotels where the grinding and crunching of the gears of a pump, telephoned through the water-pipes, is objectionable. It can be depended upon to furnish the supply of water and is unlike the old type of geared rotary pumps, which after a few months' wear lose their efficiency and can not be re-adjusted.

The Douglas Electric Pump is composed of three distinct parts: the pump, the transmitter, and the motor. The pump is the well-known and ever-popular Triplex Pump robbed of its spur gears, thereby overcoming the principal objection to geared pumps, namely, the noise. The shaft is of cast steel. The pistons closely fit the cylinders, at the top of which are the stuffing-boxes easily accessible for adjustment or repair. The pitman-rods are provided with suitable devices for taking up the wear.

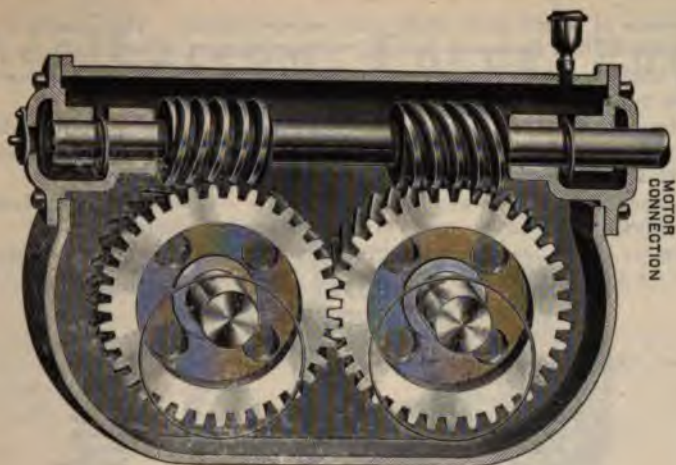


FIG. 460

Description of Transmitter

The question of a satisfactory method of transmitting the power of the standard high-speed motor to the pump is of prime consideration, as upon that method depends the efficient, durable, smooth and quiet action and generally satisfactory operation of the pumping apparatus.

A wide experience with pumps driven by belts, spur gears, friction drives, and other devices, impelled us to arrange the transmitter illustrated above for use in reducing the speed and transmitting the power of the motor to the pump.

In this device the motor is coupled direct to the upper shaft, which has a right and left hand worm thread cut upon it. These worms engage with and drive the two gears below, which in turn mesh together. It will be seen that by this device the end thrust of the worm-shaft is balanced, or transmitted through the secondary gear back to the driving gear and made to do useful work. Another advantage in this arrangement is that the pressure of the worms upon the gear teeth is divided and lubrication at these points facilitated.

The working parts are enclosed in a tight case which is partially filled with oil, the lower part of the gears being submerged. Oil is thus carried up by the gear teeth in ample quantities to thoroughly lubricate the worms. The gear and worm-shaft bearings are provided with ring oilers of the customary type, ensuring constant, thorough and automatic lubrication, which is the secret of efficiency and durability in any mechanical device.

The location of the worm-shaft above instead of below the gears is a departure in the right direction, as the pumping action of the worms upon the oil is avoided and the necessity and consequent friction of a stuffing-box to prevent the escape of oil at the worm shaft bearing is obviated.

We can furnish any standard make of motor desired, but if left to our judgment, we can assure our customer the very best electrical pumping outfit. This outfit is mounted on an iron bed plate or frame, which always maintains the correct relative position of pump and motor and is an adequate foundation.

The couplings between pump and transmitter, and between transmitter and motor, consist of three parts each, and are of a special type manufactured by

us, by means of which each shaft runs independently. This makes it possible for the shafts to find their own bearing without danger of binding.

This outfit is not an experiment, but has been on the market for years, always giving the most satisfactory results.

Send us the specifications of installation and we will help you decide what is best for your requirements. When desirable, we will inspect the premises where plant is to be placed and take complete charge of installation.

The price is as low as any first-class article can be furnished. Information will be cheerfully furnished, and correspondence is solicited.

Below we give a few sizes of outfits generally carried in stock; other combinations can be made up at short notice.

SPECIFICATIONS, Etc., FIG. 468

Size of Pump	Capacity per Hour	Feet Elevation	Size of Motor	Cipher	Price
2 x 3	350 gallons	75 feet	4 H. P.	Dotage	.....
2 x 3	350 gallons	150 feet	1 H. P.	Doting	.....
3 x 4	900 gallons	75 feet	1 H. P.	Dough	.....
3 x 4	900 gallons	200 feet	2 H. P.	Doughface	.....
4 x 4	1700 gallons	150 feet	3 H. P.	Doughty	.....
4 x 4	1700 gallons	300 feet	5 H. P.	Dovekie	.....

Triplex Power Pump

BELT-CONNECTED

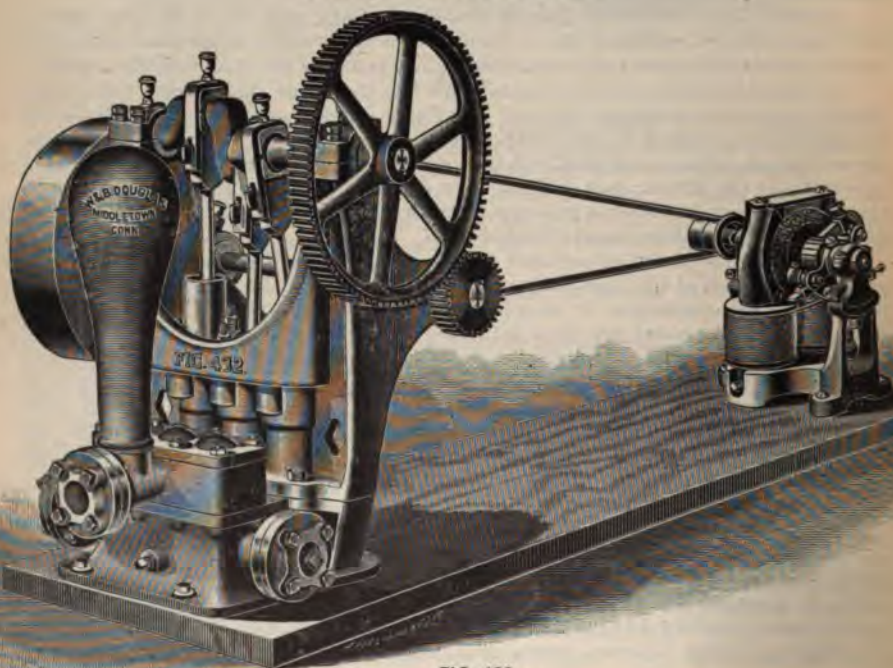


FIG. 439

PRICES ON APPLICATION

Wheelbarrow Force Pumps



FIG. 130

Figure 130 is a single-acting iron force pump, with brass rod and stuffing-box, mounted on a substantial ash-framed wheelbarrow. The suction is fitted for $1\frac{1}{4}$ -inch hose; discharge for 1-inch hose. Three feet of discharge-hose and nozzle furnished with every pump. Suction-hose at lowest market rates.

PRICE, ETC., FIG. 130

As shown in cut (Clamping) \$25.00



FIG. 131

Fig. 131 is a double-acting force pump on wheelbarrow, with wrought-iron brakes and 3 feet of $1\frac{1}{4}$ -inch discharge-hose and nozzle. $1\frac{1}{2}$ -inch suction-hose furnished at lowest market rates.

PRICE, ETC., FIG. 131

As shown in cut (Clan) \$45.00
Extra for T-brakes 5.00

Garden Engines

Figure 40 is a single-acting iron force pump with brass rod and stuffing-box mounted in a wooden box, provided with wheels and handles for portable use.

Fitted with three feet of 1-inch discharge-hose and nozzle.

Fig. 174 is the same as Fig. 40 with suction end of pump arranged to draw water either from the box, or from $1\frac{1}{4}$ -inch hose. Discharge fitted with 3 feet of 1-inch discharge-hose and nozzle. Suction-hose at lowest market rates.



FIG. 40

PRICES, ETC., FIGS. 40 & 174

Style	Cipher	Price
Figure 40.....	Capsize	\$25.00
Figure 174.....	Cockade	28.00



FIG. 8

PRICES, ETC., FIG. 8

Style	Cipher	Price
Suction from box only	Caitiff	\$35.00
Suction from box or $1\frac{1}{4}$ -inch hose	Cajole	40.00

Fig. 8 is a double-acting iron force pump mounted in wooden box, with wheels and handles for portable use. The brake is provided with wood bars.

Arranged to draw water either from box or hose, as indicated below. Fitted with 3 feet of 1-inch discharge-hose.

Prices do not include suction-hose.

Garden or Fire Engines



FIG. 84

Figure 84 is a double-acting iron force pump with wood brakes, mounted in a box having four wheels.

The pump is arranged to draw water from the box or through a hose, as the operator may desire.

Fitted with 3 feet of 1-inch discharge hose and nozzle.

Suction-hose (1¼ inches) is not included in following prices, but can be furnished at lowest market rates.

PRICES, ETC., FIG. 84

Style	Cipher	Price
Suction from either box or hose	Cell	\$60.00
Suction from box only	Cellar	55.00



FIG. 119

Figure 119 is a double-acting force pump with folding brakes, mounted in wooden box. The wheels are of ash with iron bushings, and the whole outfit is well adapted for fire protection in small towns.

The two cylinders are 4-inch bore, 8-inch stroke. Capacity, .87 gallons per revolution. Suction fitted for 2½-inch hose. Discharge for 2-inch hose.

PRICE, ETC., FIG. 119

Without hose (Cibation) \$300.00

Suction and discharge-hose furnished at lowest market rates.

Hand Fire Engines

Figure 403 is a hand force pump with folding brakes, mounted on four-wheeled truck, as shown in cut. The brake can be worked by six men.

The cylinders are 4-inch bore, $7\frac{1}{2}$ -inch stroke. Capacity per revolution, .80 gallons. Suction fitted for 2-inch hose; discharge for $1\frac{1}{2}$ -inch hose.

Suction-hose with strainer, and discharge-hose with nozzle furnished, when ordered, at lowest market rates.



FIG. 403

PRICES, ETC., FIG. 403

Material	Cipher	Price
Iron Cylinders	Derogate	\$80.00
Brass Cylinders	Derrick	100.00



FIG. 339

Fig. 339 is same pump as Fig. 403 shown above, mounted in galvanized iron box, which is afterwards painted and varnished.

The pump will draw from the box or through suction-hose. The legs are folded under the body when being moved. Dimensions of tank, 30 inches long, 22 inches wide and 16 inches deep; capacity, about 40 gallons. Prices given below do not include hose.

PRICES, ETC., FIG. 339

Style	Cipher	Price
With Iron Cylinders	Curbstone	\$100.00
With Brass Cylinders	Curdle	120.00

Village Fire Engine



FIG. 296

Figure 296 is a two-cylinder force pump with folding brakes, mounted on four-wheeled wagon. The wheels are of wood, with metal tires and bushings.

The valves are regularly of leather, and are under the cap on side which can be removed after loosening one nut. Metal valves furnished at reasonable additional charge.

Ten or twelve men can work at the brakes.

PRICES, ETC., FIG. 296

Bore Inches	Stroke Inches	Gallons per Rev.	Suction for Hose	Discharge for Hose	Iron Cylinders		Brass Cylinders	
					Cipher	Price	Cipher	Price
4	7½	.80	2 -inch	1½-inch	Crooked	\$190	Croon	\$250
5	9½	1.60	2½-inch	2 -inch	Crookedly	250	Crooning	300

Suction and discharge-hose, with fittings, furnished at lowest market rates.

Chain Pump Fixtures



FIG. 7

Figure 7 illustrates the method of setting a chain pump. Where Fig. 379 is used at the bottom of the tubing a roll to guide the chain is unnecessary.

Fig. 268 is a curb for rubber bucket chain pumps with spout, clamp and fixtures.

Prices for the above, with chain, tubing, etc., on application.



FIG. 379



FIG. 268

Fig. 379 is a galvanized shoe for the bottom of wood tubing.

PRICES, ETC., FIG. 379

For Tubing	Cipher	Price
1¼- and 1½-inch	Deafen	\$0.10
2-inch	Deafening	.10



HALF SIZE



FIG. 79

PRICES OF CHAIN AND TUBING ON APPLICATION

Grindstone Frames



FIG. 464

Figure 464 is an extra heavy grindstone frame. The stone is held between two flanges with lock nuts.



FIG. 145



FIG. 144

Fig. 145 is for power only, with one pulley.

Fig. 144 is for hand or foot power. The bearings are turned cast-iron rolls.

PRICES, ETC., FIGS. 145, 144 & 464

Figure	Style	To Swing Stone	Dimensions of Pulley	Cipher	Price
145	As shown in cut	4 x 30 inches	12 x 3 inches	Clash	\$15.00
145	With treadle added for foot power	4 x 30 inches	12 x 3 inches	Clashed	17.00
145	As shown in cut	6 x 48 inches	15 x 4 inches	Clashing	50.00
144	As shown in cut	4 x 30 inches	.....	Clarite	12.00
464	As shown in cut	4½ x 30 inches	16 x 3½ inches	Dope	25.00

Fixtures, Etc.

Figure 162 is the working part of Fig. 145, grindstone frame, with two pulleys.

Fig. 163 is Fig. 162, with one pulley.

PRICES, ETC., FIGS. 162 & 163

For Stone	Pulleys	Figure 162		Figure 163	
		Cipher	Price	Cipher	Price
36 x 4 inches	12 x 3 inches	Coast	\$9.00	Coated	\$8.00
48 x 6 inches	15 x 4 inches	Coaster	25.00	Coax	24.00
48 x 8 inches	15 x 4 inches	Coasting	35.00	Coaxer	34.00

FIG. 162



FIG. 19

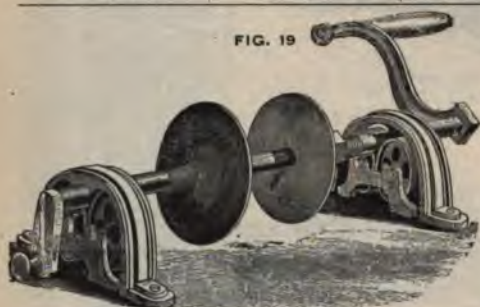


Fig. 19 is a cast-iron grindstone shaft for hand or foot power. The bearings are turned rolls.

The stone is secured by the nut and flanges shown in cut.

PRICES, ETC., FIG. 19
PER DOZEN SETS

No.	Length of Shaft	Complete Fixture		Shafts, Flanges and Handles Only	Friction Rolls and Stands Only	Stands Only
		Cipher	Price			
1	17 inches	Camel	\$18.00	\$9.00	\$5.00	\$2.00
2	20 inches	Camlet	19.50	10.00	5.00	2.00
3	25 inches	Cammed	21.00	12.00	5.00	2.00
4	30 inches	Camnock	24.00	15.00	5.00	2.00

Fig. 362 rod couplings can be supplied with thread to fit our pumps, or for any other standard in common use.

Unless otherwise ordered they will be sent with threads as indicated below:

PRICES, ETC., FIG. 362

Diam. of Rod	Threads per inch	Plain—Price per lb.	Brass—Price per lb.
$\frac{3}{4}$ inch	16	\$0.16	\$0.50
$\frac{7}{8}$ inch	14	.16	.50
$\frac{1}{2}$ inch	13	.16	.50
$\frac{1}{2}$ inch	18 ($\frac{1}{4}$ -in. pipe)	.16	.50
$\frac{3}{4}$ inch	11	.16	.50
$\frac{3}{4}$ inch	18 ($\frac{3}{4}$ -in. pipe)	.16	.50
$\frac{3}{4}$ inch	10	.16	.50

$\frac{1}{4}$ -inch rod in 10-foot lengths with couplings, per ft. net, 6 cts.
 $\frac{3}{8}$ -inch rod in 10-foot lengths with couplings, per ft. net, 8 cts.

FIG. 362

Fig. 318, well rod joint, for welding. Ends secured by brass sleeve.

PRICES, ETC., FIG. 318

Diam. of Rod	Cipher	Price Each	Diam. of Rod	Cipher	Price Each
$\frac{3}{4}$ inch	Cubited	\$1.25	$\frac{3}{4}$ inch	Cubitize	\$1.75
$\frac{3}{4}$ inch	Cubitus	1.50	1 inch	Cuagain	2.50

318



Fittings, Etc.



FIG. 316. SINGLE



FIG. 316. DOUBLE

ROLLER GUIDES

PRICES, ETC., FIG. 316

Size of Rod, Etc.	Cipher	Price
Single, for $\frac{3}{8}$ -inch Rod or $\frac{3}{8}$ Pipe.....	Cubically	\$1.25
Single, for $\frac{3}{8}$ -inch Rod only.....	Cubicone	1.25
Single, for $\frac{3}{8}$ -inch Pipe.....	Cubicular	1.25
Single, for $\frac{3}{8}$ -inch Rod.....	Cubicule	1.25
Single, for 1-inch Rod.....	Cubiform	1.75
Single, for $\frac{3}{8}$ -inch Pipe.....	Cubiformed	1.75
Double, for $\frac{3}{8}$ -inch Rods.....	Cubinvary	2.25
Double, for $\frac{3}{8}$ -inch Rods.....	Cubit	2.25



FIG. 278

HOSE CLAMP

Figure 335, floor lever, has cast-iron fulcrum, malleable-iron fork and rocker; wrought-iron brake with hard-wood grip.

Rod fitted for $\frac{3}{8}$ -inch pipe.

PRICE, ETC., FIG. 335

As shown in cut

(Curative)..... Each, \$6.00



FIG. 335

PRICES, ETC., FIG. 278

Size	Cipher	Price
For No. 1 Cistern Pump.....	Crepera	\$0.50
For No. 2 Cistern Pump.....	Crepis	.50
For No. 3 Cistern and No. 1 Pitcher.....	Crepitate	.50
For No. 4 Cistern and No. 2 Pitcher.....	Crepon	.60
For No. 5 Cistern and No. 3 Pitcher.....	Crepusele	.60
For No. 6 Cistern and No. 4 Pitcher.....	Crescence	.60

Fittings, Etc.



FIG. 216

Figure 216, cock, is supplied with right and left coupling to fit the discharge on our force pumps unless especially ordered to fit iron pipe. Discharge for New York hose.



FIG. 330

Fig. 330, 3-way cock, is fitted with right and left coupling for the discharge of our force pumps unless especially ordered to fit iron pipe. Both top and side discharge of Fig. 330 are cut for New York hose threads.

PRICES, ETC., FIGS. 216 & 330

	Number	Discharge for Hose	Cipher	Price
Fig. 216	0 and 1	1 inch	Confuse	\$2.00
	2 and 3	1 inch	Confute	2.25
	4	1 inch	Congenial	2.50
	5	1½ inches	Conger	4.00
	6	1½ inches	Congest	4.00
	8	2 inches	Congestion	5.00
	10	2 inches	Congestive	7.00
Fig. 330	2 and 3	1 inch	Cumble	\$3.25
	4	1 inch	Cumbrous	3.50
	5	1½ inches	Cunner	5.00
	6	1½ inches	Cunning	6.00



FIG. 23

Fig. 23, half-turn gooseneck, has coupling to fit the discharge on different-sized force pumps, as indicated below.



FIG. 76

Fig. 76, quarter-turn gooseneck with coupling, is suitable for side discharge on force pump air-barrels.

PRICES, ETC., FIGS. 23 & 76

	Style	Discharge for Hose	Cipher	Price
Fig. 23,	0 and 1	¾ inch	Canary	\$0.40
	2 and 3	1 inch	Cancan	.50
	4	1¼ inches	Cancerine	.60
	6	1½ inches	Candescent	.80
	8	2 inches	Candidate	1.25
Fig. 76,	2 and 3	1 inch	Cavern	\$0.40
	4	1 inch	Cavernous	.50
	6	1¼ inches	Cavicorn	.60

Fittings, Etc.



FIG. 457



FIG. 437

98, air-barrel to attach to discharge cap of our force pumps, has up outlet only, but will be supplied with two outlets, when so ordered, extra charge.

7, lead pipe coupling, consists of two iron flanges with leather gasket held together by two brass bolts, with brass nuts. The ends of the are spread with our expanding pliers, Fig. 457.

PRICES, Etc., FIG. 98

Number	Cipher for One Outlet	Cipher for Two Outlets	Price, either style
.....	Chandler	Chancon	\$2.00
.....	Changeful	Chancelle	2.00
.....	Channel	Chancroid	3.50
.....	Chant	Chancorous	5.00
.....	Chantable	Chancy	5.50
.....	Chanter	Chandala	7.75
.....	Chantress	Chandaul	7.75

ffset, like Fig. 154 Each, \$1.00

PRICE, ETC., FIGS. 437 & 457

sizes.... Per Doz., \$3.00 Fig. 457, net..... Each, \$1.75

Water Charger

Figure 188, Sand Holder and Water Charger, of which sectional cut is shown, keeps the pump constantly primed and retains the sand which in some soils is always present. The sediment can be cleaned out by removing the plug shown in cut. Connect the water charger on suction-pipe as near to the pump as possible, and out of the way of frost.

PRICES, Etc., FIGS. 188 & 64

Style	Cipher	Price
With 1¼-inch brass thread tube on inlet and outlet, suitable for Nos. 1, 2, 3, and 4 pumps	Colt	\$4.50
Water Charger only, without sand filter or clean-out, known as Fig. 64 ..	Costellan	3.50



FIG. 188

Check Valves



FIG. 113
¾ to 3 inches
FOOT VALVE



FIG. 113
3½ to 8 inches
FOOT VALVE



FIG. 275
FOOT VALVE



FIG. 198
INTERMEDIATE
VALVE

PRICES, ETC., FIG. 113

Size Inches	Iron		Galvanized		Brass	
	Cipher	Price	Cipher	Price	Cipher	Price
¾	Chimpanzee	\$1.25	Chirring	\$1.50	Chocking	\$2.75
1	Chin	1.25	Chirrup	1.50	Chocolate	2.75
1¼	Chinese	1.50	Chisel	1.75	Choice	4.35
1½	Chink	1.75	Chisley	2.25	Choir	5.30
1¾	Chinkers	2.00	Chiton	2.50	Choker	6.25
2	Chinook	2.25	Chitter	2.75	Choking	6.25
2½	Chipax	2.75	Chivalrie	3.50	Cholera	8.75
3	Chipmunk	3.75	Chivalry	4.75	Chooser	11.25
3½	Chipper	7.00	Chlanis	12.00	.....	.....
4	Chiropod	8.50	Chloral	14.00	.....	.....
4½	Chiropter	10.00	Chloralism	16.00	.....	.....
5	Chirp	12.00	Chloride	18.00	.....	.....
6	Chirper	15.00	Chock	23.00	.....	.....
7	Chirpingly	18.50	Chlorosis	30.00	.....	.....
8	Chirpist	22.00	Chloruret	38.50	.....	.....

PRICES, ETC., FIG. 275

Size	Iron		Galvanized	
	Cipher	Price	Cipher	Price
1 -inch.....	Craw	\$1.25	Cream	\$1.50
1¼ -inch.....	Crawfish	1.50	Creamer	1.75
1½ -inch.....	Crawl	1.75	Crease	2.25
1¾ -inch.....	Crawling	2.00	Creasing	2.50
2 -inch.....	Crayon	2.25	Create	2.75
2½ -inch.....	Craze	2.75	Creation	3.25
3 -inch.....	Crazily	3.75	Creative	4.75

PRICES, ETC., FIG. 198

Size	Iron		Galvanized		Brass	
	Cipher	Price	Cipher	Price	Cipher	Price
¾ -inch.....	Commissure	\$1.50	Commoigne	\$1.75	Commutate	\$4.50
1 -inch.....	Commit	1.50	Common	1.75	Commute	4.50
1¼ -inch.....	Committal	1.75	Commonly	2.25	Comose	5.00
1½ -inch.....	Committe.l	2.00	Commotion	2.50	Compact	6.50
2 -inch.....	Commode	2.50	Commune	3.00	Compactly	7.50
2½ -inch.....	Commodity	3.00	Community	4.00	Companion	12.00
3 -inch.....	Commodore	4.25	Commutant	5.50	Company	16.00

Fittings, Etc.



G. 280



FIG. 199



FIG. 472



FIG. 358



FIG. 280

Fig. 199, Strainer and Rest, for bottom of suction-pipe.

Fig. 472, Hose Strainer or Suction-Basket.

Fig. 358, Gauze Covered, Galvanized.

Fig. 280, Adjustable Spray Nozzle.

PRICES, ETC., FIG. 199

	Iron		Galvanized		Brass, for Hose	
	Cipher	Price	Cipher	Price	Cipher	Price
1/4	Comparete	\$0.62	Compearer	\$0.87	Completed	.....
1/4	Comparison	.62	Compeer	.87	Completely	.....
1/4	Compant	.75	Compend	1.00	Completive	.....
1/2	Compass	.87	Compense	1.12	Compleatory	.....
1/4	Compassed	1.00	Competent	1.37	Complex	.....
1/4	Compassing	1.12	Compile	1.62	Complexed	.....
1/4	Compassion	1.35	Complacent	1.85	Complexion	.....
1/4	Compatible	1.75	Complease	2.25	Compliance	.....

PRICES, ETC., FIG. 472

Size	Plain		Galvanized	
	Cipher	Price	Cipher	Price
1/4 inch.....	Drake	\$0.25	Dreadful	\$0.42
1/4 inch.....	Drama	.33	Dream	.60
1/4 inch.....	Dramatic	.47	Dreamer	.88
1/4 inch.....	Draper	.66	Dreary	1.25
1/4 inch.....	Drastic	1.00	Dreg	1.88
1/4 inch.....	Drawl	1.44	Dress	2.70

PRICES, ETC., FIG. 358

Size	For Pipe	Cipher	Price
.....	1 -inch	Cynic	\$0.50
.....	1 1/4 -inch	Cynical	.60
.....	1 1/2 -inch	Cynically	.70
.....	2 -inch	Cynicism	.80

PRICE, FIG. 280, PER DOZEN

3/4-inch \$15.00

We can furnish other styles of Discharge Pipes at market prices.

Repairs and Fittings for Copper Pumps



UPPER CLASP
Nos. 1, 2, 3
Each, 25 cents



LOWER CLASP
Nos. 1, 2, 3
Each, 15 cents



FLANGE CLASP
Nos. 1, 2, 3
Each, 30 cents



LOWER BOX
Nos. 1, 2, 3
Each, 60 cents



PISTON OR UPPER BOX
Nos. 1, 2, 3
Each, 60 cents



NIPPLE
Nos. 1, 2, 3
Each, 62 cents



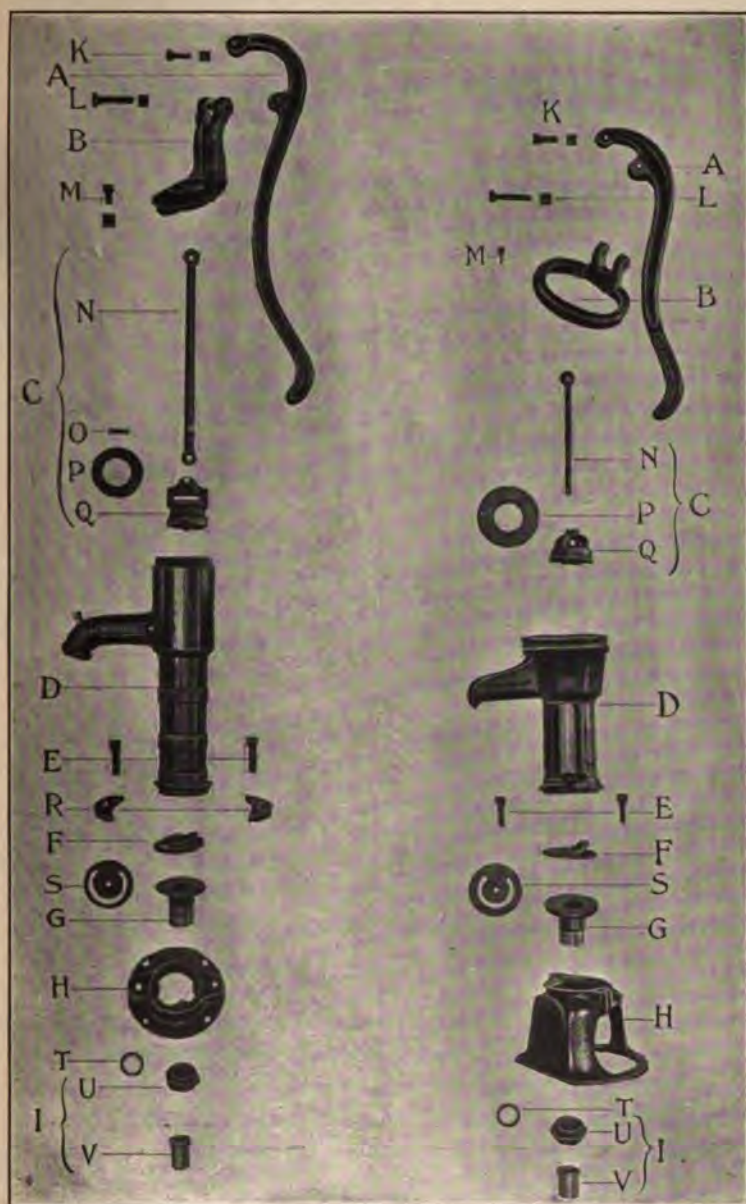
PUMP BRAKE
Nickle Plated Handle Grip
Each, 62 cents



BRAKE STAND
Nos. 1, 2, 3
Each, 62 cents

Galvanized Rods	Each,	\$0.25
Band Leathers	Per Dozen,	.75
Valve Leathers	" "	.36
Brake Bolts	" "	.36
Piston Bolts	" "	.36
Thumbscrews	" "	.36
Rod Heads	" "	1.20
Extra Lengths of Cylinder for No. 1	Per Foot,	1.27
Extra Lengths of Cylinder for No. 2	" "	1.35
Extra Lengths of Cylinder for No. 3	" "	1.42

Sectional View of Cistern and Pitcher Pumps



A—Brake, Handle or Lever
 B—Stand or Fulcrum
 C—Piston and Rod complete
 D—Cylinder
 E—Base Bolts
 F—Lower Valve complete
 G—Loose Brass Valve-Seat

H—Flange or Base
 I—Coupling and Tube
 K—Short Brake Bolt
 L—Long Brake Bolt
 M—Stand Bolt
 N—Plunger Rod only
 O—Rivet

P—Plunger Leather
 Q—Plunger only
 R—Loose Ears or Base Clamps
 S—Lower Valve Leather
 T—Washer for Suction Coupling
 U—Suction Coupling
 V—Tube

General Information

The mean pressure of the atmosphere at sea-level is about 14.7 pounds per square inch.

The pressure exerted by a column of water one foot high is .4335 pounds per square inch.

Therefore, if a perfect vacuum were maintained in a pipe, the pressure of the atmosphere would cause water to rise in the pipe as many feet as .4335 is contained times in 14.7, which is 33.9.

In ordinary practice we do not recommend over 25 feet of vertical suction lift at sea-level, and one foot less for each 1,000 feet above sea-level. Wherever possible, the working cylinder should be submerged so that the valves are always primed.

1 U. S. gallon of water	= 231.00 cub. inch.	= 8.33 lbs.	= 3.785 litres
1 cubic foot of water	= 7.48 U. S. gals.	= 62.38 lbs.	= 28.300 litres
1 Imperial or English gallon	= 277.27 cub. inch.	= 10.00 lbs.	= 4.536 kilos.
1 liter of water	= .264 U. S. gals.	= 2.2046 lbs.	= 1 kilo.
1 gallon of petroleum	= 6½ lbs.		
1 miner's inch of water	= 12 gallons per minute		

Capacities of pumps in this catalogue are given in U. S. gallons. To find the capacity in English gallons, multiply by .833; ($\frac{1}{3}$ approx.) To find the capacity in litres, multiply by 3.7854; ($3\frac{3}{4}$ approx.)

One horse-power is the force required to raise 33,000 pounds one foot per minute; therefore, to find the horse-power required for a pump, it is necessary to determine the number of gallons desired per minute, which, multiplied by the height in feet and by $8\frac{1}{2}$, the weight of one gallon of water, will give the number of foot pounds per minute. This product, divided by 33,000, will give the horse-power required.

To find the approximate theoretical horse-power required for a pump, multiply gallons per minute by height in feet and divide by 4,000. Actual horse-power required on small installations will be nearly double the above amount. The efficiency of the motor or engine which is to operate the pump must also be carefully considered; on very small sizes this is sometimes not over 50 %. Correct alignment and adjustment greatly affect the amount of power consumed.

$$\text{Electrical H.P. consumed} \dots\dots\dots = \frac{\text{Volts} \times \text{Amperes}}{746}$$

$$\text{Per Cent. Efficiency of Electric Motor} = \frac{\text{Rated H.P.} \times 746}{\text{Rated Volts} \times \text{Rated Amperes}}$$

The capacity of a pump depends upon:

- I. Diameter of cylinder.
- II. Length of stroke.
- III. Number of strokes in a given time. (Usually one minute.)

The power required depends upon:

- I. Quantity of water desired in a given time.
- II. Vertical height to which water is to be raised.
- III. Friction in the pipes and in the pump itself.

F O R M U L A S

When

D = Diameter of pump cylinder in inches.

S = Length of stroke in inches.

Q = Quantity of water per minute in gallons.

H = Height in feet to which water is to be raised.

Then

$D^2 \times S \times .7854$ = Capacity per stroke in cubic inches.

$D^2 \times S \times .0034$ = Capacity per stroke in gallons.

$D^2 \times S \times .0004545$ = Capacity per stroke in cubic feet.

$D^2 \times S \times .028356$ = Capacity per stroke in pounds of water.

$\frac{Q \times H \times 8.34}{33.000}$

Or,—

$Q \times H \times .0002572$) = Theoretical horse-power required.

The above capacities are theoretical. A reasonable allowance should be made for leakage, slip of valves, friction in pipes and shafting, efficiency of motive power, etc.

For ordinary use, and as a check on calculations, we append the following:

A P P R O X I M A T E R U L E S

The capacity in gallons of one single-acting pump at 50 feet piston speed per minute = the square of the diameter = D^2

The capacity in gallons of a two-cylinder single-acting pump, or one double-acting pump at 50 feet piston speed per minute = twice the square of the diameter = $2 D^2$

The capacity in gallons of a single-acting triplex pump at 50 feet piston speed per minute = three times the square of the diameter = $3 D^2$

The capacity in gallons of a two-cylinder double-acting pump at 50 feet piston speed per minute = four times the square of the diameter = $4 D^2$

The capacity in gallons of a double-acting triplex pump at 50 feet piston speed per minute = six times the square of the diameter = $6 D^2$

A column of water exerts a pressure of about one-half pound per foot of height. One pound of pressure will raise a column of water 2.3 feet.

Water is usually reckoned at $8\frac{1}{2}$ pounds to the gallon and $7\frac{1}{2}$ gallons to the cubic foot.

Steam boilers require 30 pounds of water per horse-power hour. To find the number of gallons per minute required by any boiler, multiply the horse-power by .07.

Thus: 200 horse-power boiler requires $200 \times .07 = 14$ gallons per minute.

(This formula allows a margin of one-sixth for leakage and other emergencies.)

For condensers allow $1\frac{1}{2}$ gallons per minute per indicated horse-power.

TO DETERMINE SIZE AND SPEED OF PULLEYS AND GEARS

The driving pulley is called the Driver, and the driven pulley the Driven.

If the number of *teeth in gears* are used instead of diameter, in these calculations, number of teeth must be substituted wherever diameter occurs.

To determine the diameter of Driver; the diameter of the Driven and its revolutions, and also revolutions of Driver being given:

$$\frac{\text{Diam. of Driven} \times \text{revolutions of Driven}}{\text{Revolutions of Driver}} = \text{Diam. of Driver}$$

To determine the diameter of Driven; the revolutions of the Driven and diameter and revolutions of the Driver being given:

$$\frac{\text{Diam. of Driver} \times \text{revolutions of Driver}}{\text{Revolutions of Driven}} = \text{Diam. of Driven}$$

To determine the revolutions of the Driver; the diameter and revolutions of the Driven, and diameter of the Driver being given:

$$\frac{\text{Diam. of Driven} \times \text{revolutions of Driven}}{\text{Diameter of Driver}} = \text{Revs. of Driver}$$

To determine the revolutions of the Driven; the diameter and revolutions of the Driver, and diameter of the Driven being given:

$$\frac{\text{Diam. of Driver} \times \text{revolutions of Driver}}{\text{Diameter of Driven}} = \text{Revs. of Driven}$$

Theoretical Capacity Per Stroke

FOR ONE SINGLE-ACTING PUMP

FOR ONE DOUBLE-ACTING OR TWO SINGLE-ACTING PUMPS, MULTIPLY BY TWO
 FOR SINGLE-ACTING TRIPLEX, MULTIPLY BY THREE
 FOR DOUBLE-ACTING DUPLEX, MULTIPLY BY FOUR
 FOR DOUBLE-ACTING TRIPLEX, MULTIPLY BY SIX

LENGTH OF STROKE IN INCHES

2 3 4 5 6 7 8 9 10 12 14 15 16

CAPACITY PER STROKE IN GALLONS

.010	.015	.021	.020	.031	.037	.042	.047	.053	.063	.074	.079	.084
.012	.019	.025	.032	.038	.041	.051	.057	.064	.077	.089	.096	.102
.015	.022	.03	.038	.045	.053	.061	.068	.076	.091	.107	.114	.122
.02	.031	.041	.052	.062	.072	.083	.093	.104	.124	.145	.156	.166
.027	.04	.054	.068	.081	.095	.108	.122	.136	.163	.19	.204	.217
.034	.051	.068	.086	.103	.12	.137	.154	.172	.206	.241	.258	.275
.042	.063	.085	.106	.127	.148	.17	.191	.212	.255	.297	.318	.34
.051	.077	.102	.128	.154	.179	.205	.231	.257	.308	.359	.385	.411
.061	.091	.122	.153	.183	.214	.244	.275	.306	.367	.428	.459	.489
.071	.107	.143	.179	.215	.251	.287	.323	.359	.431	.503	.538	.574
.083	.124	.166	.208	.249	.291	.333	.374	.416	.499	.583	.624	.666
.095	.143	.191	.239	.286	.334	.382	.43	.478	.573	.669	.687	.764
.108	.163	.217	.272	.326	.38	.435	.489	.544	.652	.761	.816	.87
.122	.184	.245	.307	.368	.429	.491	.552	.614	.736	.859	.921	.982
.137	.206	.275	.344	.413	.481	.55	.619	.688	.826	.963	1.032	1.101
.153	.23	.306	.383	.46	.536	.613	.69	.767	.92	1.073	1.15	1.227
.17	.255	.34	.425	.51	.595	.68	.765	.85	1.02	1.19	1.275	1.36
.187	.281	.374	.468	.562	.655	.749	.843	.937	1.124	1.311	1.405	1.499
.205	.308	.411	.514	.617	.719	.822	.925	1.028	1.234	1.439	1.542	1.645
.224	.337	.449	.562	.674	.786	.899	1.011	1.124	1.348	1.573	1.686	1.789
.244	.367	.489	.612	.734	.856	.979	1.101	1.224	1.468	1.713	1.836	1.958
.265	.398	.531	.664	.796	.929	1.062	1.195	1.328	1.593	1.859	1.992	2.124
.287	.43	.574	.718	.861	1.005	1.148	1.292	1.436	1.795	2.01	2.154	2.298
.309	.464	.619	.774	.929	1.084	1.239	1.394	1.549	1.858	2.168	2.323	2.479
.333	.499	.666	.833	.999	1.166	1.332	1.499	1.666	1.999	2.332	2.499	2.665
.408	.612	.816	1.021	1.225	1.429	1.633	1.837	2.042	2.45	2.858	3.063	3.266
.435	.652	.87	1.088	1.305	1.523	1.74	1.958	2.176	2.611	3.046	3.264	3.481
.55	.826	1.101	1.377	1.652	1.927	2.203	2.478	2.754	3.304	3.855	4.131	4.406
.68	.102	1.36	1.7	2.04	2.38	2.72	3.06	3.4	4.08	4.76	5.1	5.44
.822	1.234	1.645	2.057	2.464	2.879	3.291	3.725	4.113	4.936	5.759	6.17	6.582
.979	1.468	1.858	2.448	2.937	3.422	3.916	4.406	4.896	5.875	6.854	7.344	7.833
1.149	1.723	2.297	2.872	3.445	4.022	4.596	5.17	5.745	6.894	8.042	8.616	9.192
1.332	1.998	2.665	3.331	3.997	4.664	5.33	5.996	6.663	7.994	9.328	9.993	10.66
1.529	2.294	3.059	3.824	4.589	5.354	6.119	6.884	7.649	9.178	10.7	11.47	12.23
1.74	2.61	3.48	4.35	5.22	6.09	6.96	7.83	8.703	10.44	12.18	13.05	13.92
2.202	3.303	4.404	5.505	6.606	7.707	8.808	9.909	11.01	13.21	15.41	16.51	17.61
2.72	4.08	5.44	6.8	8.16	9.52	10.88	12.24	13.6	16.32	19.04	20.4	21.76

Table of Theoretical Horse-Power Required to Raise Water to Different Heights

Feet	5	10	15	20	25	30	35	40	45	50	60	75	90	100	125	150	175	200
Gals. per Min.																		
5	.006	.012	.019	.025	.031	.037	.044	.05	.06	.06	.07	.09	.11	.12	.16	.19	.22	.25
10	.012	.025	.037	.050	.062	.075	.087	.10	.11	.12	.15	.19	.22	.25	.31	.37	.44	.50
15	.019	.037	.056	.075	.094	.12	.131	.15	.17	.19	.22	.28	.34	.37	.47	.56	.66	.75
20	.025	.050	.075	.100	.125	.150	.175	.20	.22	.25	.30	.37	.45	.50	.62	.75	.87	1.00
25	.031	.062	.093	.125	.156	.187	.219	.25	.28	.31	.37	.47	.56	.62	.78	.94	1.09	1.25
30	.037	.075	.112	.150	.187	.225	.262	.30	.34	.37	.45	.56	.67	.75	.94	1.12	1.31	1.50
35	.043	.087	.131	.175	.219	.262	.306	.35	.39	.44	.52	.66	.79	.87	1.08	1.31	1.53	1.75
40	.050	.100	.150	.200	.250	.300	.350	.40	.45	.50	.60	.75	.90	1.00	1.25	1.50	1.75	2.00
45	.056	.112	.168	.225	.281	.337	.394	.45	.51	.56	.67	.84	1.01	1.12	1.41	1.69	1.97	2.25
50	.062	.125	.187	.250	.312	.375	.437	.50	.56	.62	.75	.94	1.12	1.25	1.56	1.87	2.19	2.50
60	.075	.150	.225	.300	.375	.450	.525	.60	.67	.75	.90	1.12	1.35	1.50	1.87	2.25	2.62	3.00
75	.093	.187	.281	.375	.469	.562	.656	.75	.84	.94	1.12	1.40	1.69	1.87	2.34	2.81	3.28	3.75
90	.112	.225	.337	.450	.562	.675	.787	.90	1.01	1.12	1.35	1.68	2.02	2.25	2.81	3.37	3.94	4.50
100	.125	.250	.375	.500	.625	.750	.875	1.00	1.12	1.25	1.50	1.87	2.25	2.50	3.12	3.75	4.37	5.00
125	.156	.312	.469	.625	.781	.937	1.094	1.25	1.41	1.56	1.87	2.34	2.81	3.12	3.91	4.69	5.47	6.25
150	.187	.375	.562	.750	.937	1.125	1.312	1.50	1.69	1.87	2.25	2.81	3.37	3.75	4.69	5.62	6.56	7.50

For horse-power at 250 feet, take the amount at 125 feet and double it, and so on.

For horse-power at 200 gallons, take the amount at 100 gallons and double it, and so on.

Friction of Water in Pipes

Friction-loss in Pounds Pressure per square inch, for each 100 feet of length in different size clean Iron Pipes discharging given quantities of water per minute.

G. A. ELLIS, C.E.

Gals. per Min.	SIZES OF PIPES — INSIDE DIAMETER															
	½ In.	1 In.	1½ In.	2 In.	2½ In.	3 In.	4 In.	6 In.	8 In.	10 In.	12 In.	14 In.	16 In.	18 In.		
5	3.3	0.84	0.31	0.12	...	...	...	...	...	...	...	...	...	...	...	...
10	13.0	3.16	1.05	0.47	0.12	...	...	...	...	...	...	...	...	...	...	...
15	28.7	6.98	2.38	0.97	...	...	...	...	...	...	...	...	...	...	...	...
20	50.4	12.3	4.07	1.66	0.42	...	...	...	...	...	...	...	...	...	...	...
25	78.0	19.0	6.40	2.62	...	0.21	0.10	.027	...	...	...	...	...	...	...	...
30	...	27.5	9.15	3.75	0.91	...	...	...	...	...	...	...	...	...	...	...
35	...	37.0	12.4	5.05	...	...	...	...	...	...	...	...	...	...	...	...
40	...	48.0	16.1	6.52	1.60	...	.20	...	...	...	...	...	...	...	...	...
45	20.2	8.15	...	...	...	...	...	...	...	...	...	...	...	...
50	24.9	10.0	2.44	0.81	0.35	0.09	...	...	...	...	...	...	...	...
75	56.1	22.4	5.32	1.80	0.74	0.23	...	...	...	...	...	...	...	...
100	39.0	9.46	3.20	1.31	0.33	0.05	...	...	...	...	...	...	...
125	14.9	4.89	1.99	...	...	...	...	...	...	...	...	...
150	21.2	7.0	2.85	0.69	0.10	...	...	...	...	...	...	...
175	28.1	9.46	3.85	...	...	...	...	...	...	...	...	...
200	37.5	12.47	5.02	1.22	0.17	...	...	...	...	...	...	...
250	19.66	7.76	1.89	0.26	0.07	0.03	0.01	...	...	...	...
300	28.06	11.2	2.66	0.37	0.09	0.04	...	...	...	...	...
350	15.2	3.65	0.50	0.12	0.05	0.02	...	...	...	...
400	19.5	4.73	0.65	0.16	0.06	...	...	...	...	...
450	25.0	6.01	0.81	0.20	0.07	0.03	...	...	...	...
500	30.8	7.43	0.96	0.25	0.09	0.04	0.017	0.009	0.005	...
750	2.21	0.53	0.18	0.08	...	...	...	...
1000	3.88	0.94	0.32	0.13	0.062	0.036	0.020	...
1250	1.46	0.49	0.20	...	...	...	...
1500	2.09	0.70	0.29	0.135	0.071	0.040	...
1750	0.95	0.38	...	...	...	...
2000	1.23	0.49	0.234	0.123	0.071	...
2250	0.63	...	...	...	...
2500	0.77	0.362	0.188	0.107	...
3000	1.11	0.515	0.267	0.150	...
3500	0.697	0.365	0.204	...
4000	0.910	0.472	0.263	...
4500	0.593	0.333	...
5000	0.730	0.408	...

Areas of Circles

Diam. Inches	Area	Diam. Inches	Area	Diam. Inches	Area	Diam. Inches	Area	Diam. Inches	Area	Diam. Inches	Area	Diam. Inches	Area
1/4	.012	4	12.56	13	132.73	22	380.13	31	754.7	40	1256.6	49	1885.7
1/2	.049	5	15.90	14	143.13	23	397.60	32	779.3	41	1288.2	50	1924.4
3/4	.110	6	19.63	15	153.94	24	415.47	33	804.2	42	1320.2	51	1963.5
1	.196	7	23.75	16	165.13	25	433.73	34	829.5	43	1352.6	52	2002.9
1 1/4	.441	8	28.27	17	176.71	26	452.39	35	855.3	44	1385.4	53	2042.8
1 1/2	.785	9	33.18	18	188.69	27	471.43	36	881.4	45	1418.6	54	2083.0
1 3/4	.994	10	38.48	19	201.06	28	490.8	37	907.9	46	1452.2	55	2123.7
2	1.227	11	44.17	20	213.82	29	510.7	38	934.8	47	1486.1	56	2164.7
2 1/4	1.767	12	50.26	21	226.98	30	530.9	39	962.1	48	1520.5	57	2206.1
2 1/2	2.405	13	56.74	22	240.52	31	551.5	40	989.8	49	1555.2	58	2248.0
2 3/4	3.141	14	63.61	23	254.46	32	572.5	41	1017.8	50	1590.4	59	2290.2
3	3.976	15	70.88	24	268.80	33	593.9	42	1046.3	51	1625.9	60	2332.8
3 1/4	4.908	16	78.54	25	283.53	34	615.7	43	1075.2	52	1661.9		2375.8
3 1/2	5.939	17	86.59	26	298.64	35	637.9	44	1104.4	53	1698.2		2419.2
3 3/4	7.06	18	95.03	27	314.16	36	660.5	45	1134.1	54	1734.9		2463.0
4	8.29	19	103.87	28	330.06	37	683.4	46	1164.1	55	1772.0		2507.1
4 1/4	9.62	20	113.10	29	346.36	38	706.8	47	1194.6	56	1808.5		2551.7
4 1/2	11.04	21	122.71	30	363.05	39	730.6	48	1225.4	57	1847.4		2596.7

Head of Water in Feet and the Equivalent Pressure in Pounds

Feet Head	Lbs. Press.	Feet Head	Lbs. Press.	Feet Head	Lbs. Press.
5	2.17	70	30.3	200	86.6
10	4.33	80	34.6	250	108.2
15	6.50	90	39.0	300	129.9
20	8.66	100	43.3	350	151.5
25	10.83	110	47.6	400	173.2
30	12.99	120	52.0	500	216.5
35	15.16	130	56.3	600	259.8
40	17.32	140	60.6	700	303.1
45	19.49	150	65.0	800	346.4
50	21.65	160	69.2	900	389.7
60	26.09	180	78.0	1000	433.0

Pressure of Water in Pounds and the Equivalent Head in Feet

Lbs. Press.	Feet Head	Lbs. Press.	Feet Head	Lbs. Press.	Feet Head
5	11.5	70	161.6	180	415.6
10	23.0	80	184.7	190	438.9
15	34.6	90	207.8	200	461.7
20	46.2	100	230.9	225	519.5
25	57.7	110	253.9	250	577.2
30	69.3	120	277.0	275	643.0
35	80.8	130	300.1	300	692.7
40	92.3	140	323.2	325	750.4
45	103.9	150	346.3	350	808.1
50	115.4	160	369.4	400	922.6
60	138.5	170	392.5	500	1152.5

Capacity of Round Tanks and Cisterns — One Foot High

Diam. in Feet	Gallons	Diam. in Feet	Gallons
2	23.5	17	1,698
3	52.9	18	1,903
4	94	19	2,121
5	147	20	2,350
6	212	22	2,844
7	288	24	3,384
8	376	26	3,971
9	476	28	4,606
10	588	30	5,288
11	711	32	6,016
12	846	36	7,617
13	993	40	9,400
14	1,152	45	11,897
15	1,322	56	14,688
16	1,504	60	21,151

Wrought Iron Welded Pipe
DIMENSIONS, WEIGHTS, ETC., OF STANDARD SIZES FOR
STEAM, GAS, WATER, OIL, ETC.

Nominal Inside Diameter Inches	Actual Outside Diameter Inches	Internal Area Inches	Weight per Foot of Length Pounds	Contents Gallons per Foot	Weight of Water per Foot of Length Pounds
1/2	.84	.304	.84	.0102	.085
3/4	1.05	.533	1.12	.0230	.190
1	1.31	.862	1.67	.0408	.349
1 1/4	1.66	1.496	2.25	.0638	.527
1 1/2	1.9	2.038	2.69	.0918	.760
2	2.37	3.355	3.66	.1632	1.356
2 1/2	2.87	4.783	5.77	.2550	2.116
3	3.5	7.388	7.54	.3673	3.049
3 1/2	4	9.837	9.05	.4998	4.155
4	4.5	12.730	10.72	.6528	5.405
4 1/2	5	15.939	12.49	.8263	6.851
5	5.56	19.990	14.56	1.020	8.500
6	6.62	28.889	18.76	1.469	12.312

Estimated Values of Foreign Coins

Corrected to July 1, 1923

COUNTRY	MONEY UNIT	Value in Terms of U.S. Gold	COUNTRY	MONEY UNIT	Value in Terms of U.S. Gold
Argentina Republic	Peso	96.5	Greece	Drachma	19.3
Austria-Hungary	Crown	20.3	Haiti	Gourde	96.5
Belgium	Franc	19.3	India	Rupce	22.4
Bolivia	Boliviano	26.4	Italy	Lira	19.3
Brazil	Milreis	54.6	Japan	Yen	49.5
British America	Dollar	1.00	Libera	Dollar	1.00
Cent Amer States	Peso	26.4	Mexico	Dollar	41.8
China	Tael	26.5	Netherlands	Florin	40.2
	Shanghai	56.5	Norway	Dollar	1.014
	Hankow	63.3	Norway	Crown	26.8
	Canton	63.3	Peru	Sol	46.7
Colombia	Peso	26.4	Portugal	Milreis	1.06
Cuba	Peso	26.4	Rumania	Leu	51.5
Denmark	Crown	26.5	Rumania	Leu	19.3
Ecuador	Guano	46.5	Spain	Peseta	26.5
Egypt	Pound	4.943	Sweden	Crown	19.3
Finland	Mark	19.3	Switzerland	Franc	44.2
France	Franc	19.3	Turkey	Lira	40.4
German Empire	Mark	23.5	Venezuela	Bolivar	19.2
Great Britain	Pound sterling	4.8675			

Metric Equivalents

Linear Measure

1 inch = 2.54 centimeters
1 foot = 30.48 centimeters
1 yard = 91.44 centimeters
1 mile = 1.609 kilometers
1 kilometer = 0.621 miles

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1 yard = 91.44 centimeters
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1 kilometer = 0.621 miles

Square Measure

1 square inch = 6.45 square centimeters
1 square foot = 929 square centimeters
1 square yard = 836 square centimeters
1 square mile = 2.6 square kilometers
1 square kilometer = 0.39 square miles

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1 square yard = 836 square centimeters
1 square mile = 2.6 square kilometers
1 square kilometer = 0.39 square miles

Measure of Volume

1 cubic inch = 16.4 cubic centimeters
1 cubic foot = 28.3 cubic liters
1 cubic yard = 1.35 cubic meters
1 liter = 1.057 quarts
1 quart = 0.946 liters
1 gallon = 3.785 liters
1 barrel = 158.98 liters

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Weights

1 gram = 0.035 ounce
1 kilogram = 2.205 pounds
1 ton = 2,240 pounds

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APPROXIMATE METRIC EQUIVALENTS

1 inch = 2.5 centimeters
1 foot = 30 centimeters
1 yard = 90 centimeters
1 mile = 1.6 kilometers
1 kilometer = 0.6 miles

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Horse Power Belting Will Transmit

Width of Belt in Inches	HORSE POWER PER 100 FEET VELOCITY OF BELT		Width of Belt in Inches	HORSE POWER PER 100 FEET VELOCITY OF BELT	
	Single Belt	Double Belt		Single Belt	Double Belt
1	.09	.18	12	1.09	2.18
2	.18	.36	14	1.27	2.55
3	.27	.55	16	1.45	2.91
4	.36	.73	18	1.64	3.27
5	.45	.91	20	1.82	3.64
6	.55	1.09	22	2.00	4.00
7	.64	1.27	24	2.18	4.36
8	.73	1.46	28	2.55	5.09
9	.82	1.64	32	2.91	5.82
10	.91	1.82	36	3.27	6.55
11	1.	2.	40	3.64	7.27

In the calculations for horse powers in the above table, the belt is assumed to run about horizontally, the semi-circumference of smaller pulley has been considered as the ordinary arc of contact. Any reduction of this contact will make proportional reduction of horse power.

Horse Power Shafting Will Transmit

Diameter of Shaft in Inches	REVOLUTIONS PER MINUTE									
	100	125	150	175	200	225	250	300	350	400
	HORSE POWER TRANSMITTED									
15-16	1.2	1.4	1.7	2.1	2.4	2.6	3.1	3.6	4.3	5.6
1 3-16	2.4	3.1	3.7	4.3	4.9	5.5	6.1	7.3	8.5	9.7
1 7-16	4.3	5.3	6.4	7.4	8.5	9.5	10.5	12.7	14.8	16.9
1 11-16	6.7	8.4	10.1	11.7	13.4	15.1	16.7	20.1	23.4	26.8
2 15-16	10.0	12.5	15.0	17.5	20.0	22.5	25.0	30.0	35.0	40.0
2 3-16	14.3	17.8	21.4	24.9	28.5	32.1	35.6	42.7	49.8	57.0
2 7-16	19.5	24.4	29.3	34.1	39.0	44.1	48.7	58.5	68.2	78.0
2 11-16	26.0	32.5	39.0	43.5	52.0	58.5	65.0	78.0	87.0	104.0
3 15-16	33.8	42.2	50.6	59.1	67.5	75.9	84.4	101.3	118.2	135.0
3 3-16	43.0	53.6	64.4	75.1	85.8	96.6	107.3	128.7	150.3	171.6
3 7-16	53.6	67.0	79.4	93.8	107.2	120.1	134.0	158.8	187.6	214.4
3 11-16	65.9	82.4	97.9	115.4	121.8	148.3	164.8	195.7	230.7	243.6
4 15-16	80.0	100.0	120.0	140.0	160.0	180.0	200.0	240.0	280.0	320.0
4 7-16	113.9	142.4	170.8	199.3	227.8	256.2	284.7	341.7	398.6	455.6
4 11-16	156.3	195.3	234.4	273.4	312.5	351.5	390.6	468.7	546.8	625.0

REPAIR LIST

EXTRA PARTS FOR DOUGLAS PUMPS



When ordering castings having raised characters upon them, BE SURE TO COPY ALL THE FIGURES, DASHES, Etc., in the order which they occupy on the pump. Much confusion will thus be avoided

Cistern Pumps

Figs. 1, 22, 41, 47, 51, 57, 70, 202, 264

Number	0	1	2	3	4	5	6	8	10
Diameter of Cylinder—Inches ..	2	2¼	2½	2¾	3	3¼	3½	4	4½
Diameter of Suction Pipe—Inches	1	1	1¼	1½	1¾	2	2	2	2½
Brake, Handle or Lever	\$0.45	\$0.50	\$0.55	\$0.70	\$0.85	\$1.00	\$1.25	\$1.50	\$1.50
Stand or Fulcrum .....	.50	.55	.60	.80	.90	1.10	1.30	1.50	1.60
Cylinder, Iron	1.25	1.50	1.75	2.00	2.50	3.00	3.50	5.00	6.00
" All Brass	5.00	6.00	8.00	10.00	13.00	15.00	20.00	.....	.....
" Brass Part to Figs. 47, 51	3.00	3.75	4.75	5.75	8.00	10.00	13.00	.....	.....
Iron Spout Section to Figs. 47, 51 .....	.87	1.00	1.25	1.50	1.75	2.00	2.50	.....	.....
Plunger with Rod .....	.87	.75	.90	1.10	1.25	1.50	1.75	2.10	2.25
" only .....	.52	.60	.75	.90	1.00	1.25	1.50	1.75	1.90
" Rod only .....	.15	.15	.15	.20	.25	.25	.25	.35	.35
" Poppet only .....	.12	.12	.16	.20	.25	.30	.38	.40	.50
Brass Plunger with Iron Rod	1.35	1.50	1.80	2.25	2.50	3.00	3.75	.....	.....
Brass Plunger only	1.20	1.35	1.65	2.05	2.25	2.75	3.50	.....	.....
Plunger Leather .....	.11	.11	.11	.11	.11	.15	.15	.20	.20
Lower Valve Leather .....	.11	.11	.11	.11	.11	.15	.15	.20	.20
Lower Valve complete .....	.26	.26	.26	.26	.26	.35	.35	.45	.45
Iron Valve Weight, with Screw and Washer .....	.15	.15	.15	.15	.15	.20	.20	.25	.25
Flange or Base, Figs. 1, 22, and 202; also Brass-bushed Flange, Figs. 41 and 264 .....	.80	1.00	1.15	1.30	1.50	1.75	2.00	2.25	.....
Flange or Base for Loose Brass Valve-Seat, Figs. 51, 57, 70 and 264 .....	.30	.37	.45	.50	.60	.67	.75	.....	1.50
Loose Brass Valve-Seat, Figs. 51, 57, 70, 202, and 264 .....	.55	.65	.75	.85	.95	1.05	1.20	.....	2.00
Base Clamps or Loose Ears, Figs. 41, 51, 202, and 264. Per set .....	.20	.20	.20	.20	.25	.25	.25	.30	.30
Iron Coupling and Brass Solder Tube .....	.45	.45	.55	.55	.70	.70	.90	1.00	1.25
Iron Coupling and Brass Thread Tube .....	.67	.67	.75	.75	1.05	1.10	1.45	1.50	2.00
Iron Coupling only .....	.20	.20	.25	.25	.35	.35	.45	.50	.62
Cast-Iron Nut for Iron Pipe....	.30	.30	.35	.35	.45	.45	.60	2¼ in. .70	3 in. .80
Brass Thread Tube only .....	.47	.47	.50	.50	.70	.75	1.00	2 in. 1.00	2½ in. 1.38
Brass Solder Tube only .....	.25	.25	.30	.30	.35	.35	.45	.50	.63
All Bolts and Set-Screws, each..	.08	.08	.08	.08	.08	.08	.08	.08	.08

Pitcher Pumps

Figs. 120, 162, 205, 249, 272, 274

Number	1	2	3	4	5	6
Diameter of Cylinder—Inches	2½	3	3½	4	4½	5
Diameter of Suction Pipe—Inches	1	1¼	1½	1½	2	2½
Brake, Handle or Lever	\$0.50	\$0.50	\$0.70	\$0.70	\$1.00	\$1.25
Stand or Fulcrum, Figs. 120, 192, 205 and 249 .....	.40	.50	.60	.70	.80	1.00
Stand or Fulcrum, Figs. 272, 274, 409 .....	.60	.70	.90	1.00	.....	.....
Cylinder, Iron	1.50	1.75	2.00	2.50	3.00	3.50
" Porcelain-lined	2.25	2.75	3.25	4.00	.....	6.00
Brass Part to Fig. 249 Cylinder	4.75	6.00	7.00	8.00	.....	.....
Iron Spout Section to Fig. 249 Cylinder	1.50	1.75	2.00	2.50	.....	.....
Plunger with Rod .....	.75	.90	1.05	1.15	1.45	1.75
" only .....	.60	.75	.90	1.00	1.25	1.50
" Rod only .....	.15	.15	.15	.15	.20	.25
" Poppet only .....	.10	.12	.15	.18	.25	.30
Galvanized Plunger and Rod, Figs. 249 and 192	1.00	1.25	1.50	1.75	.....	2.50
" only .....	.80	1.05	1.30	1.55	.....	2.15
" Rod only .....	.20	.20	.20	.20	.....	.35
" Poppet only .....	.15	.18	.25	.38	.....	.50
Plunger Leather .....	.11	.11	.11	.15	.20	.30
Lower Valve Leather .....	.11	.11	.11	.15	.20	.30
" complete .....	.26	.26	.26	.30	.40	.50
" Weight with Screw and Washer .....	.15	.15	.15	.15	.20	.20
Flange or Base for Loose Brass Valve-Seat .....	.75	.90	1.00	1.12	1.50	2.00
" Brass Bushed	1.25	1.50	1.65	1.85	2.50	3.50
" All Iron	1.00	1.25	1.40	1.60	2.25	3.25
Loose Brass Valve-Seat only .....	.75	.95	1.20	1.50	1.75	2.50
Iron Coupling and Brass Solder Tube .....	.45	.55	.55	.70	.90	1.00
Iron Coupling only .....	.20	.25	.25	.35	.45	.50
Cast-Iron Nut for Iron Pipe .....	.30	.35	.35	.45	.60	.70
Brass Solder Tube only .....	.25	.30	.30	.35	.45	.50
All Bolts and Set-Screws, each .....	.08	.08	.08	.08	.08	.08

"Out-Door" Lift Pumps

Figs. 102 and 103

Number	1	2 & 3	4	5	6
Brake Handle or Lever	\$0.50	\$0.70	\$0.85	\$1.00	\$1.25
Stand or Fulcrum .....	.55	.80	.90	1.10	1.30
Upper Cylinder	1.50	2.25	2.50	3.00	3.50
Short Rod for Upper Section .....	.15	.20	.25	.25	.25
Long Rod for 3-foot Set-Length .....	.40	.40	.40	.50	.50
Brake, Stand and Base Bolts, each .....	.08	.08	.08	.08	.08

For Repairs to Lower Cylinder see pages 174 and 175.

"Drive-Well" Pumps

Figs. 178, 225, 226

Number	0	1
Brake, Handle or Lever	\$1.25	\$1.25
Stand or Fulcrum	1.75	1.75
Upper Cylinder	3.50	3.75
Rod for Upper Section, Figs. 178, 226 .....	.50	.50
Rod for complete Pump, Figs. 178, 226 .....	.75	.75
Rod for Upper Section, Fig. 225 .....	.....	.75
Rod for complete Pump, Fig. 225 .....	.....	1.00
Forked Rod Head, Fig. 225 .....	.....	.25
Pad or Connecting Link, Fig. 225 .....	.....	.30
Brace .....	.50	.50
All Brake, Stand and Set Bolts, each .....	.08	.08

For Repairs to Lower Cylinder see pages 174 and 175.

Swan Lift Pumps

Figs. 211, 215, 325, 387

[Fig. 325 takes No. 2 size]

Number	1	2
Brake, Handle or Lever	\$1.25	\$1.25
Stand or Fulcrum, Figs. 211, 215, 387	1.00	1.00
" Fig. 325		2.00
Upper Cylinder	3.75	4.00
Rod for Upper Section, Fig. 387 .....	.50	.50
" Fig. 325 .....	.75	.75
" complete Pump, Figs. 211, 215 .....	.75	.75
" Fig. 325	1.00	1.00
Forked Rod Head, Fig. 325 .....	.25	.25
Pad or Connecting Link, Fig. 325 .....	.30	.30
Brace .....	.50	.50
All Brake and Stand Bolts and Set-Screws, each .....	.08	.08
Flange or Base, Fig. 215	1.25	1.75
Base Clamps, Lugs or Buttons, per pair .....	.25	.25
Cast-Iron Set-Length, Fig. 215, Regular Diameter	3.00	4.00
Cast-Iron Set-Length, Fig. 215, 3-inch Bore		4.50
Cast-Iron Set-Length, Fig. 215, 3-inch Bore—Long		5.50

For Repairs to Lower Cylinder see pages 174 and 175.

Yard Pumps

Figs. 2, 58, 62, 121, 151, 197, 207

[Figs. 62 and 207 take No. 2 size]

Number	1	2	3
Diameter of Cylinder—Inches	2½	3¼	4
Brake, Handle or Lever	\$1.25	\$1.40	\$2.25
Stand or Fulcrum, Figs. 2, 58, 121, 151, 197 .....	.80	1.35	2.00
" Figs. 62, 207, with Stuffing-box		2.00	.....
Brass Stuffing-box or Gland only .....		.65	.....
Cast-Iron Links for Rod, Figs. 62, 207, per pair .....		.25	.....
Rod End, Figs. 62, 207 .....		.25	.....
Short Rod for Upper Section, Fig. 207 .....		.75	.....
Long Rod for complete Pump, Figs. 62, 207		1.00	.....
Rod for Upper Section, Figs. 58, 121, 151 .....	.50	.50	.50
Rod for complete Pump, Figs. 2, 121, 197 .....	.75	.75	.75
Plunger only .....	.75	1.25	1.75
Cylinder	3.75	5.25	6.25
Brace .....	.50	.50	.50
Air-Barrel, Figs. 62, 207		3.00	.....
Air-Barrel Couplings and Discharge Tube		1.10	.....
Discharge Gooseneck and Coupling, Figs. 62, 207 .....		.75	.....
Flange or Base	1.25	1.75	2.00
Loose Brass Valve-Seat, Figs. 2, 62 .....	.75	1.05	1.50
" Fig. 151 .....	.75	1.20	2.00
Cast-Iron Set-Length, Figs. 2, 62	3.00	4.50	5.50
Valve-Seat Coupling, Figs. 2, 62 .....	.50	.75	1.00
Hook Bolts with Nuts, Figs. 62, 207, each .....	.10	.10	.10
All other Bolts .....	.08	.08	.08

For Repairs to Lower Cylinder see pages 174 and 175.

Well and Windmill Pumps and Pump Standards

Figs. 122, 123, 152, 219, 228, 246, 294, 297, 314, 322, 368, 369, 371, 388, 389, 408

Number	1	2
Air-Barrels, Figs. 246, 297, 371, 388, 389		\$3.00
Bolts, each	\$0.08	.08
Brakes, Figs. 122, 123, 152, 228	1.25	1.40
Brakes, Figs. 297, 368, 388, 389		1.25
Brakes, Figs. 219, 246, 294, 314, 322, 323, 324, 369, 371, 408		1.50
Braces—all Figures named above .....	.50	.50
Race Clamps, each .....	.12	.12
Cylinder—Upper—or Standard, Figs. 122, 123, 152	5.25	6.75
" " " " Figs. 219, 246, 294, 297, 388		4.00
" " " " Figs. 314, 408, and No. 1. Fig. 228	5.25	5.25
" " " " Fig. 322		7.00
" " Upper Part of Standard, Figs. 368, 369, 371, 389		3.00
" " Lower Part of Standard, Figs. 368, 369, 371, 389		4.00
Cock, Figs. 322, 408		2.25
Coupling and Tube for Air-Barrel .....		.75
Flange or Base, Figs. 122, 123, 152, 228	1.25	1.75
Flange or Base, Figs. 219, 246, 297, 388		1.75
Head with Brass Gland, Figs. 122, 152, and No. 2. Fig. 228	1.50	2.00
Brass Gland or Stuffing-box only .....	.60	.85
Head with Brass Gland, Figs. 246, 297, 314, 322, 371, 388, 389, 408, and No. 1. Fig. 228, New Style	1.50	....
Brass Gland or Stuffing-box only, Fig. 246, and New Style, Fig. 228 .....	.85	....
Malleable Pin, connecting Brake with Rod on Windmill Pumps .....	.15	....
Steel Pin for Shackle or Swing Fulerum .....	.15	....
Flat Rod with Rod Connection, Figs. 246, 314, 322, 371, 408	1.00	....
Rod Connection only, with Set-Screw .....	.50	.50
Rod complete, Figs. 219, 294, 369 .....	.75	.75
Round Rod for Upper Section, Figs. 123, 152, 228, 246, 297, 314, 322, 368, 371, 388, 389, 408 .....	.75	.75
Round Rod for complete Pump, Figs. 122, 123, 228, 297	1.00	1.00
Forked Rod End or Cross-head, Figs. 122, 123, 152, 228, 297, 368, 388, 389 .....	.25	.25
Shackle or Swing Fulerum, Figs. 246, 314, 322, 371, 408 .....	.50	.50
Slides or Guides for Flat Rod, each .....	.25	.25
Stand, Figs. 122, 123, 152, and No. 2. Fig. 228	1.50	2.00
Stand, Figs. 297, 368, 388, 389, and No. 1. Fig. 228, New Style	2.00	....
Stand or Hood, Figs. 219, 246, 294, 314, 322, 369, 371, 408	2.50	....

Well and Windmill Standards

Figs. 189, 206, 227, 270, 271, 310, 407

Brake, Handle or Lever, Figs. 189, 206, 227, with Malleable Link	\$2.25
Brake, Fig. 270, 271, 407, 6-inch Stroke	2.00
" " " " " " " " 12-inch	2.25
Brake Bar or Rocker Arm, Fig. 310	2.00
Brake Levers, Wood, Fig. 310, each .....	.75
Stand or Fulerum, Fig. 189, 270	2.00
Stand or Fulerum with Brass Gland, Figs. 206, 310	3.00
Brass Gland only, Figs. 206, 310	1.00
Stand, Hood or Fulerum with Brass Gland, Figs. 271, 407, 6-inch Stroke	2.75
Stand for 12-inch Stroke with Gland	3.10
Brass Gland only, Figs. 271, 407 .....	.75
Shackle or Swing Fulerum .....	.50
Slide or Guide for Flat Rod .....	.25
Flat Rod with Coupling and Set-Screw, Figs. 270, 271, 407	1.00
Rod Coupling only with Set-Screw .....	.50
Rod Head, Figs. 206, 189, 310 .....	.50
Round Steel Rod, Figs. 189, 206, 310 .....	.75
Round Steel Rod, Figs. 270, 271, 6-inch Stroke .....	.50
Round Steel Rod, Figs. 270, 271, 12-inch Stroke .....	.75
Brass Case Rod, Fig. 407	1.50
Upper Part to Standard, Figs. 189, 206, 270, 271, 310	3.00
" " " " " " " " 407	5.25
Lower " " " " " " " " 189, 206, 270, 271, 310	5.00
Flange or Base, Fig. 407	2.00
Pipe Flange or Tapping Plate, Fig. 407, 1½ and 1¼-inch .....	.50
" " " " " " " " 407, 2-inch .....	.60

Well and Windmill Standards *Continued*

Figs. 189, 206, 227, 270, 271, 310, 407

Fig. 189, 270	\$1.00
rel, Figs. 206, 271, 310	3.00
407	3.50
rge Coupling and Tube, Figs. 271, 310	1.10
" " 407	1.05
Gooseneck, Figs. 271, 310 .....	.75
" " .....	.50
l Bolts, each .....	.10
ther Bolts and Set-Screws, each .....	.08

"Hawkeye" or "Economic" Force Pumps

Figs. 331, 352, 353, 377, 419

	3-inch	3½-inch
ake, Handle or Lever	\$1.50	\$1.50
ake Bar or Rocker, Fig. 377	2.00	
stand or Fulcrum, Fig. 331, 352, 377	1.00	1.25
" " 353, 419	2.00	2.00
Shackle or Swing Fulcrum, Figs. 353, 419 .....	.50	.50
Wood Levers, Fig. 377, each .....	.75	
Frame Top	6.00	
half	3.00	
Offset .....	.50	
Iron Coupling to Gooseneck .....	.35	.50
Gooseneck only	1.25	1.75
Piston or Plunger only for Lower Cylinder .....	.90	1.25
Short Rod only for Lower Cylinder .....	.15	.15
Upper Piston with Short Rod .....	.50	
Poppet .....	.20	
Rod Head, Figs. 331, 352 .....	.25	
Cap or Head to Air-Pipe .....	.50	
Yoke		1.00
Valve-Seat .....	.75	.95
Lower Section complete less Pistons	6.50	8.00
Extra Lengths of Set, per foot .....	.75	

Windmill Force Pumps

Figs. 382 and 383

Number	2	4	6	8
Diameter of Cylinder—Inches	2½	3	3½	4
Brake, Handle or Lever, 6-inch Stroke	\$1.50	\$1.50	\$2.00	
" " " 8-inch	1.75	1.75	2.25	\$2.5
" " " 12-inch	2.25	2.25	2.75	3.0
Iron Gland or Bushing for Hood .....	.25	.25	.75	.7
Stand, Hood or Fulcrum with Brass Gland, 6-inch Stroke	2.75	2.75	3.50	
" " " " 8-inch	3.00	3.00	4.00	4.
" " " " 12-inch	3.25	3.25	4.50	5.
Brass Gland or Stuffing-box only .....	.75	.75	1.00	1
Shackle or Swing Fulcrum for 6-inch and 8-inch Stroke .....	.50	.50	.50	
for 12-inch Stroke .....	.75	.75	1.00	1
Slide or Guide for Flat Rod .....	.25	.25	.25	
Flat Rod with Coupling and Set-Screw, 6-inch	1.00	1.00	1.00	
" " " " 8-inch	1.00	1.00	1.25	
" " " " 12-inch	1.25	1.25	1.50	
Rod Coupling or Connection only .....	.50	.50	.50	
Brass Rod only, 6-inch Stroke	2.00	2.25	3.00	
" " " 8-inch	2.40	2.50	3.75	
" " " 12-inch	3.00	3.00	4.25	
Iron Plunger only .....	.75	1.00	1.50	
Brass Plunger only	1.65	2.25	3.50	
Plunger Leather .....	.11	.11	.15	
Discharge Valve Leather .....	.15	.20	.25	
Valve Leather .....	.20	.20	.30	

Windmill Force Pumps *a Continued*

Figs. 382 and 383

	2	4	6	8
Cylinder—Inches	2½	3	3½	4
r, 6-inch Stroke	\$5.00	\$5.50	\$7.00	\$8.00
linder, 6-inch Stroke	20.00	24.00	30.00	....
er (Barrel only), 6-inch Stroke	10.00	12.00	15.00	....
" 8-inch	11.00	13.00	17.00	20.00
" 12-inch	13.00	15.00	21.00	28.00
Brass Cylinder, Fig. 383, per set	.60	.90	1.25	1.50
ection to Brass Cylinder	2.75	3.50	4.50	5.00
or Base, Fig. 382	2.00	2.00	2.50	3.00
or Base,	10.00	10.00	....	....
ottom Head, Fig. 383	1.50	1.50	2.00	2.50
rel	3.50	4.00	5.00	6.00
ge Coupling and Thread Tube	.75	1.05	1.45	1.50
only	.50	.70	1.00	1.00
each	.10	.10	.10	.10
ts and Set-Screws, each	.08	.08	.08	.08
eable Pin for Rod	.15	.15	.15	.15

Self-Priming Windmill Pumps

Figs. 281 and 367

Cylinder—Inches	2	2½	3	3½	4	4½	5	5½	6
ader, 8-inch Stroke	\$5.50	\$5.50	\$7.00	\$7.00	\$....	\$....	\$....	\$....	\$....
" 10-inch	6.50	6.50	8.00	8.00	9.50	9.50	12.00	12.00	....
" 12-inch	7.50	7.50	9.00	9.00	11.00	11.00	15.00	15.00	22.00
Cylinder, 8-in. Strk.	7.00	8.00	9.00	....	....	....	....	....	....
" 10-in.	8.00	9.00	10.50	12.00	13.50	15.00	16.50	18.00	....
" 12-in.	9.00	10.00	12.00	13.50	15.00	16.50	18.00	20.00	22.00
er and Rod, Fig. 281	....	....	....	....	....	....	....	....	....
roke	4.25	4.75	5.75	7.25	....	....	....	....	....
" " "	4.25	4.75	5.75	7.25	8.75	9.75	10.75	11.25	....
" " "	4.50	5.00	6.00	7.50	9.00	10.00	11.00	11.50	13.50
er only	2.50	3.00	3.75	4.75	5.50	6.50	7.50	8.00	8.50
Fig. 281, with Nuts	....	....	....	....	....	....	....	....	....
oke	3.00	3.00	3.00	....	....	....	....	....	....
roke	3.00	3.00	3.00	4.00	5.00	5.00	5.00	5.00	....
roke	3.25	3.25	3.25	4.50	5.50	5.50	5.50	5.50	6.50
Fig. 367	2.50	2.50	2.50	2.50	3.50	3.50	....	....	....
h Coupling and Set	....	....	....	....	....	....	....	....	....
367	1.00	1.00	1.00	1.00	1.00	1.00	....	....	....
or Stuffing-box	.75	.75	.75	.75	1.50	1.50	1.50	1.50	2.00
e-Seat to Inside	....	....	....	....	....	....	....	....	....
Top Plate for Inside	1.25	1.50	1.75	2.00	2.50	3.00	4.00	5.00	6.00
ame, each	.75	.75	.85	.85	1.00	1.00	1.50	1.50	2.00
of Air-Barrel	.20	.20	.30	.30	.45	.45	.60	.60	.90
of Air-Barrel	3.50	3.50	4.50	4.50	7.00	7.00	9.00	9.00	15.00
of Air-Barrel	2.50	2.50	3.00	3.00	5.00	5.00	7.00	7.00	10.00
of Air-Barrel Gasket	.35	.35	.50	.50	.65	.65	.85	.85	1.50
ap.	.90	.90	1.25	1.25	1.75	1.75	1.75	1.75	2.50
oupling and Brass	....	....	....	....	....	....	....	....	....
be	.75	.75	1.05	1.05	1.50	2.00	2.00	2.00	3.00
l Tube only	.50	.50	.70	.70	1.00	1.38	1.38	1.38	1.75
late	.50	.50	.75	.75	1.00	1.00	1.25	1.25	1.75
late Gasket	.20	.20	.30	.30	.40	.40	.50	.50	.65
ge Coupling	....	....	....	....	1.50	1.50	1.50	1.50	2.00
ge Gasket	....	....	....	....	.20	.20	.25	.25	.35
her	.11	.11	.11	.15	.20	.20	.30	.35	.40
Leather	.11	.11	.11	.15	.20	.20	.30	.35	.40
complete	.26	.26	.26	.30	.35	.35	.50	.55	.60
lve Leather	.15	.15	.20	.20	.30	.30	.30	.30	.50
lve complete	.30	.30	.35	.35	.45	.45	.45	.45	.65
Leathers	.37	.37	.42	.50	.70	.70	.80	.90	1.30
t, Washer and Screw	.15	.15	.15	.15	.15	.15	.15	.15	.15
Leathers and	....	....	....	....	....	....	....	....	....
	1.15	1.15	1.50	1.60	2.50	2.50	3.25	3.40	5.00

“Pendulum” Pumps

Figs. 209, 210, 235, 244, 364

[Figs. 210 and 235 take No. 1 size. Fig. 364 takes No. 2 size]

Number	00	0	1	2
Diameter of Cylinder—Inches	2	2½	3½	4
Diameter of Suction Pipe—Inches	1	1	1½	2
Cylinder, Fig. 209, 244, 210 (Upper)	\$3.50	\$4.00	\$6.00	\$8.00
Top Cap or Head with Rubber Packing .....	.90	1.00	1.25	1.40
Cap Rubber Ring Packing .....	.25	.25	.30	.35
Top Plug .....	.25	.25	.25	.25
Brass Nipple for Spout .....	.25	.25	.30	.40
Iron Cap for Brass Nipple .....	.20	.20	.25	.30
Iron Cock Handle .....	.20	.20	.20	.25
Brass Plug for Cock, Fig. 244	1.00	1.50	2.00	3.00
Plunger only	1.00	1.25	1.65	2.15
Poppet only .....	.12	.16	.30	.40
Rod only .....	.15	.15	.20	.30
Brake, Handle or Lever, Figs. 209, 210, 235, 244, with Set-Screw	1.00	1.12	1.50	1.87
Iron Gland with Brass Box .....	.75	.75	1.00	1.25
Brass Gland or Stuffing-box only .....	.50	.50	.60	.75
Rocker Shaft, Figs. 209, 210, 244, 364 .....	.90	1.00	1.25	1.50
Rocker Shaft, Fig. 235 .....	..	..	1.50	..
Flange or Base, Figs. 209, 244 .....	.80	1.15	1.75	2.25
Flange or Base, Fig. 210 .....	..	..	1.50	..
Base Clamps, each .....	.10	.10	.12	.12
Plunger Leather .....	.11	.11	.15	.20
Lower Valve Leather .....	.11	.11	.15	.20
Lower Valve complete .....	.26	.26	.30	.40
Valve Weight, Screw and Washer .....	.15	.15	.15	.20
Hinge Bolts with Thumb Nuts, each .....	.15	.15	.15	.15
All other Bolts and Set-Screws, each .....	.08	.08	.08	.08
Coupling and Brass Solder Tube .....	.45	.45	.55	.90
Cast-Iron Nut for Iron Pipe .....	.30	.30	.35	.60

House Force Pumps

Figs. 12, 59, 75, 91, 99, 100, 156, 157, 180, 186, 208, 241, 282, 283, 306, 420

Number	0	1	2	3	4	6
Diameter of Cylinder—Inches	2	2½	2½	2½	3	3½
Brake, Handle or Lever	\$0.55	\$0.60	\$0.75	\$0.90	\$1.10	\$1.60
Stand or Fulcrum, with Set-Screw .....	.75	.85	1.00	1.25	1.50	2.50
Wrought-Iron Pad, or Connecting Link .....	.25	.25	.25	.28	.30	.40
Brass Plunger Rod only	1.15	1.25	1.40	1.50	1.75	2.50
Iron Plunger only .....	.52	.60	.75	.90	1.00	1.50
Brass Plunger only	1.20	1.35	1.65	2.05	2.25	3.50
Brass Poppet only .....	.12	.12	.16	.20	.25	.38
Iron Cylinder Head with Brass Gland or Stuffing-box and Ring Packing	1.00	1.15	1.35	1.50	1.60	2.00
Brass Gland or Stuffing-box only .....	.50	.50	.60	.60	.60	.85
Iron Cylinder	3.00	3.25	3.50	3.75	4.25	6.00
All Brass Cylinder	8.00	9.00	10.00	12.00	14.00	20.00
Brass Cylinder—Barrel only	4.00	5.00	6.00	7.00	8.00	12.00
Iron Spout to Brass Cylinder	2.00	2.25	2.50	2.75	3.50	4.75
Iron Clamp for Brass Cylinder, complete .....	.50	.50	.60	.75	.90	1.00
Upper Cylinder only, to Figs. 180, 186 .....	..	..	3.50	3.50	4.00	..
Valve-Seat Coupling, Figs. 59, 75, 99, 100, 156, 208, 283 .....	.38	.40	.45	.50	.55	.75
Flange or Base, Fig. 241, 420 .....	.80	1.00	1.15	1.30	1.50	2.00
Flange or Base, Fig. 12, 91, 157, 208 .....	.50	.60	.75	.90	1.15	1.50
Brass Valve-Seat only .....	.55	.65	.75	.85	.95	1.20
Base Clamps, each .....	.10	.10	.10	.10	.12	.12
Discharge Cap .....	.70	.70	.80	.80	.90	1.15
Double Coupling, Right and Left Thread .....	.40	.40	.45	.45	.50	.60
Single Coupling with Thread Tube .....	.67	.67	.75	.75	1.05	1.45
Brass Thread Tube only .....	.47	.47	.50	.50	.70	1.00
Single Coupling with Brass Solder Tube .....	.45	.45	.55	.55	.70	.90
Brass Solder Tube only .....	.25	.25	.30	.30	.35	.45
Windmill Brake, Fig. 283 .....	..	..	1.25	1.35	1.50	2.00
Stand, Fig. 283 .....	..	..	1.75	2.00	2.25	2.50
Shackle or Swing Fulcrum, Fig. 283 .....	.50	.50	.50	.50	.50	.50
Slide for Flat Rod .....	.25	.25	.25	.25	.25	.25
Round and Flat Steel Rod, Fig. 283 .....	..	..	1.00	1.00	1.00	1.50

Common Force Pumps

Figs. 3, 4, 27 28, 29, 69, 90, 16, 153, 155, 307

	1	2	3	4	5	6	8	10
or of Cylinder—Inches	2¼	2½	2¾	3	3¼	3½	4	4½
or of Suction Pipe—Inches	1	1¼	1½	1¾	2	2	2	2½
Handle or Lever, Figs. 3, 4, 27, 28, 153	\$0.90	\$1.00	\$1.10	\$1.25	\$1.25	\$1.60	\$3.75	\$4.25
or Fulcrum .....	.70	.75	.85	1.00	1.00	1.30	2.25	3.25
Stand .....	.25	.30	.35	.40	.45	.60	.85	1.00
Rod or Pitman	1.00	1.25	1.25	1.50	1.75	1.75	2.00	4.00
ad, Figs. 4, 27, 28 .....	.25	.25	.28	.30	.30	.40	.....	.....
ing Rod, Fig. 29 .....	.50	.50	.60	.60	.60	.75	.....	.....
od, Figs. 3, 27, 69, 90, 116, 153, 307	1.50	1.60	1.75	2.00	2.50	3.25	5.00	7.00
od, Figs. 4, 28, 29	1.25	1.40	1.50	1.75	2.00	2.50	.....	.....
Iron .....	.60	.75	.90	1.00	1.25	1.50	1.75	1.90
Brass	1.35	1.65	2.05	2.25	2.75	3.50	.....	.....
Leather .....	.11	.11	.11	.11	.15	.15	.20	.20
alve Leather .....	.11	.11	.11	.11	.15	.15	.20	.20
ge Valve Leather .....	.11	.11	.11	.11	.15	.15	.20	.20
Discharge Valves, complete, each .....	.26	.26	.26	.26	.35	.35	.45	.45
ive Weight, Washer and Screw .....	.15	.15	.15	.15	.20	.20	.25	.25
Iron	3.50	4.00	4.25	4.50	5.00	6.00	9.00	12.00
Brass	8.00	9.00	10.00	12.00	15.00	20.00	35.00	50.00
ad, Brass Gland and Ring Packing	1.15	1.35	1.50	1.60	1.85	2.00	2.25	2.75
ead with Gland and Ring Packing	2.50	2.75	3.00	3.25	3.75	4.00	5.00	6.00
and or Stuffing-box only .....	.50	.60	.60	.60	.75	.85	1.00	1.00
eat, Iron .....	.75	.80	.85	.95	1.10	1.25	.....	.....
Brass	2.25	2.40	2.55	2.85	3.25	3.75	4.50	7.00
ge Cap Iron .....	.70	.80	.80	.90	1.00	1.15	1.45	1.75
Brass	1.50	1.75	1.75	2.00	2.50	3.00	4.50	6.00
upling with Brass Thread Tube .....	.67	.75	.75	1.05	1.10	1.45	1.50	2.00
upling with Brass Thread Tube	1.05	1.25	1.25	1.75	1.80	2.35	3.00	4.00
Tube only .....	.47	.50	.50	.70	.75	1.00	1.00	1.38
ge Offset, Iron .....	.80	.90	.90	1.00	.....	.....	.....	.....
Coupling—Right and Left Hand .....	.40	.45	.45	.50	.60	.60	.75	1.00

"A" Pumps

Figs. 25, 26, 66, 154, 233, 286

	1	2	3	4	5	6	8	10
or of Cylinder—Inches	2¼	2½	2¾	3	3¼	3½	4	4½
linder only	\$4.00	\$5.50	\$6.00	\$6.50	\$8.00	\$8.50	11.00	15.00
ylinder only	13.00	16.00	20.00	25.00	35.00	40.00	50.00	90.00
Handle or Lever, Figs. 25, 26, 66, 233 .....	.90	1.00	1.10	1.25	1.25	1.60	3.75	4.25
Handle or Lever, Fig. 286 .....	.....	1.25	1.35	1.50	1.50	2.00	.....	.....
Stand or Fulcrum only, Figs. 25, 154, 233 .....	.80	.60	.70	.80	1.35	1.50	2.50	3.50
Stand for Brake Stand .....	.37	.40	.45	.50	.55	.62	1.00	1.25
or Swing Fulcrum, Fig. 286 .....	.....	.50	.50	.50	.50	.50	.50	.....
Guide for Rod, Fig. 286 .....	.....	.25	.25	.25	.25	.25	.25	.....
Rod or Pitman, Fig. 25	1.00	1.25	1.25	1.50	1.75	1.75	2.00	4.00
od, Fig. 25	1.65	1.75	1.90	2.25	2.75	3.50	5.50	7.75
inger only .....	.75	.90	1.05	1.20	1.50	1.70	2.00	2.60
ad, with Brass Gland or Stuffing-nd Ring Packing	1.15	1.35	1.50	1.60	1.85	2.00	2.25	2.75
ead with Gland	2.75	3.00	3.25	3.50	4.00	5.00	7.00	9.00
and or Stuffing-box only .....	.50	.60	.60	.60	.75	.85	1.00	1.00
harge Cap .....	.70	.80	.80	.90	1.10	1.40	2.00	2.50
ive-Seat or Bottom .....	.90	1.00	1.20	1.35	1.67	2.00	2.75	3.75
upling and Brass Thread Tube	2.50	3.00	3.25	4.00	4.75	6.00	8.00	11.00
hread Tube only .....	.67	.75	.75	1.05	1.10	1.45	1.50	2.00
hread Tube only	1.05	1.25	1.25	1.75	1.80	2.35	3.00	4.00
nd Left Hand Double Coupling .....	.40	.45	.45	.50	.60	.60	.75	1.00
ing Packing .....	.11	.11	.11	.11	.15	.15	.20	.20
or Discharge Valve Leather .....	.16	.18	.20	.25	.30	.35	.40	.50
alve complete .....	.46	.48	.50	.55	.65	.70	.75	.85
or Suction Valve Leather .....	.20	.25	.30	.35	.40	.45	.60	.75
alve complete .....	.50	.55	.60	.70	.75	.80	.95	1.10
Piston Leathers, per set of 2 .....	.20	.25	.30	.35	.45	.50	.60	.75

Double-Acting Horizontal Pumps *Continued*

Figs. 236, 257, 292, 305, 465, 469

Figures	236, 257, 292, 305					465	469
Diameter of Cylinder—Inches	2½	3	4	5	6	5	2½
Piston Rod, Single Ended	\$2.00	\$2.25	\$3.25	\$4.75	\$6.25	\$0.75	\$2.00
" " Double Ended			6.00	8.00	9.00		
" " Fig. 254	3.50	4.00	7.00	9.00	12.00		
Rod End .....			.75	.75	1.00	.25	
Iron Connecting-Rod only, for Fig. 257 Brake .....				.40	.50		
Forked Rod End for Connecting-Rod .....				.25	.35		
Shackle or Swing Fulcrum .....	.75	.80	.90	1.00	1.50	1.00	.75
Brake Bar	1.00	1.50	1.50	1.50	2.50	1.50	.75
Brake (including handle)	3.00	4.00	4.00	4.00	5.00		1.75
Wood Handle only .....	.50	.75	.75	.75	1.00	1.00	
Head Bolts, with Brass Nuts, each .....	.25	.25	.25	.25	.35		
Long Bolt for Shackle .....	.08	.08	.08	.08	.12	.10	.08
All other Bolts not specified, each .....	.08	.08	.08	.08	.08	.08	.08
Complete Sets of Bolts and Nuts, Single end	1.50	2.50	2.60	2.70	3.50	.90	.55
" " Double end			2.80	2.90	3.80		
Complete Set of Leathers and Gaskets	1.35	1.65	2.25	2.75	3.25	1.75	1.35

"Manhattan" Force Pumps

Figs. 340, 341, 342, 343, 399, 400

Cylinder, Fig. 341, 343, 399	\$5.00
Cylinder Head, Figs. 340, 341, 343	1.00
Cylinder Head, Figs. 399, 400	1.25
Stuffing-box .....	.50
Rod, Figs. 340, 341, 343	1.50
" " Figs. 342, 399, 400	1.25
Brass Roll and Pin for Rod .....	.25
Plunger (Brass)	1.20
Plunger and Rod, Fig. 341	2.70
Plunger and Valve Leathers, per set of 2 .....	.15
Valve-Seat Coupling, Figs. 340, 341, 343	1.00
Valve-Seat, Figs. 340, 341, 343 .....	.75
Flange, Figs. 399, 400	3.00
Discharge Coupling and Gooseneck .....	.75
Frame, or Bracket, Figs. 340, 341, 343	1.25
Brake, Handle or Lever, all Figs. .....	.75
Stand or Fulcrum .....	.50
Cylinder Clamp, Figs. 340, 341, 343 .....	.25
All Bolts and Set-Screws, each .....	.08

Spraying Pumps

Figs. 80 and 259

Figures	80	259
Cylinder only	\$2.50	\$1.75
Piston-Rod, Fig. 80, or Inside Tube, Fig. 259 .....	.50	1.25
Handle, complete .....	.50	.50
Wood Handle only .....	.15	.15
Piston only .....	.75	.60
Brass Balls, each, net .....		.10
Piston and Rod	1.25	1.85
Leathers, per set of 2 .....	.20	
Lower Valve and Strainer, Fig. 259		1.00
Suction Hose, complete, to Fig. 80	1.00	
Suction Coupling and Tube .....	.25	
Suction Strainer .....	.10	
Air-Barrel or Discharge Head with Gland	1.50	1.00
Brass Gland or Stuffing-box only .....	.50	.35
Discharge Hose and Pipe complete	2.00	2.00
" " Coupling and Tube .....	.25	.25
" " Pipe and Tip .....	.75	.75
" " Tip only .....	.20	.20
" " Rose Sprinkler .....	.25	.25
Stirrup or Cylinder Clamp with Thumb-Screw		1.00
Brass Thumb-Screw only .....		.25
Step or Foot-Piece	1.00	.40

Brass Single-Acting Force Pumps

Figs. 71, 72, 168

Figures.....	71 and 72			168	
Number	0	2	3	0	3
Diameter of Cylinder—Inches	2	2½	2¾	2	2¾
Brake	\$1.75	\$1.75	\$1.75	\$1.00	\$1.75
Brake Stand complete	2.00	2.00	2.00	.70	2.00
Front Plate to Brake Stand .....	.60	.60	.60	.....	.60
Guide Stand .....	.25	.30	.30	.25	.30
Forked Rod or Pitman	2.00	2.00	2.00	.60	1.25
Piston and Rod	2.00	2.80	3.00	2.00	2.50
Piston only	1.20	1.65	2.05	1.20	2.05
Poppet only .....	.12	.16	.20	.12	.20
Crosshead only .....	.50	.50	.50	.35	.50
Leathers, per set .....	.33	.33	.33	.33	.33
Cylinder	8.00	9.00	10.00	5.00	8.00
Cylinder Head, complete with Gland	3.00	3.50	4.00	1.50	2.75
Cup, Figs. 71, 72 .....	.75	.75	.75	.....	.....
Brass Gland or Stuffing-box only .....	.50	.60	.60	.50	.60
Discharge Cap, Fig. 71	1.25	1.75	1.75	.....	.....
Fig. 72	1.50	2.00	2.00	.....	.....
Skeleton Coupling for Cap, Figs. 71, 72	1.00	1.50	1.50	.....	.....
Iron Pipe Nut for Fig. 168 discharge .....	.....	.....	.....	.30	.35
Valve-Seat .....	.55	.75	.85	.55	.85
Valve-Seat Coupling	1.25	1.75	2.00	1.00	1.75
Cylinder Clamps, each .....	.75	.85	.90	.50	.60
Front part, each .....	.15	.20	.20	.15	.20

Diaphragm Pumps

Figs. 376 and 381

Number	1	2
Diameter of Diaphragm—Inches	9	12½
Diameter of Suction Pipe—Inches	2½	3
Fig. 376, Round Bottom only	\$4.00	\$8.00
Fig. 381, Square Bottom only	5.00	10.00
Top or Spout Section	2.50	5.50
Bolts and Nuts (3), each .....	.25	.35
Wrought-Iron Brake	2.50	3.00
Shackle or Brake Socket .....	.80	1.00
Bridge or Yoke .....	.50	1.15
Bridge Bolts and Nuts (2), each .....	.15	.40
Upper Iron Ring "D" .....	.40	.80
Lower Iron Ring .....	.50	1.00
Upper Valve with Gasket	1.00	1.25
Gasket only, net .....	.20	.25
Lower Valve, with Gasket .....	.80	1.00
Gasket only, net .....	.15	.20
Guide Pin or Stop for Upper Valve A .....	.15	.15
Large Steel Pin for Brake Socket .....	.20	.35
Small .....	.15	.25
Galvanized Hose Strainer or Suction Basket	1.88	2.70
Brass Nipple for Suction	2.20	3.35
Brass Hose Coupling and Tube	2.75	3.75
Suction Hose, per Foot, net	1.50	1.75

Grouting and Contractors' Pumps

Figs. 107 and 248

er	1	2
er of Cylinder—Inches	2½	4
st Cap	\$10.00	\$18.00
st Cap Bolt and Nut	1.75	3.00
lers, each .....	.75	1.00
and Rod	2.50	5.00
only, with Packing	3.00	5.00
arrel	2.00	3.50
r Shaft	5.00	10.00
s per pair, Fig. 107	2.50	5.00
" " 248	5.00	11.00
" " 83	3.00	2.50
Leather .....	.90	1.50
complete with Weights and Screws	1.50	2.25
Leathers, per set of 2 .....	.30	.60

"Palmetto" Force Pump

Fig. 410

ler	\$3.50
e or Base	1.75
or Fulcrum with Brass Gland	2.00
Gland only .....	.75
and Rod	1.00
only	2.25
nd with Set-Screw .....	.90
hackle or Rod Link .....	.50
Vent Plug .....	.15
Vent Plug .....	.25
Coupling with Blank .....	.15
lts and Set-Screws, each .....	.75
	.30
	.08

Covered Crank Power Pump

Fig. 286

ster of Cylinder—Inches	3	4
ster of Suction Pipe—Inches	1½	2
ster of Discharge Pipe—Inches	1½	1½
or Flange	\$3.25	\$4.25
ler Iron	4.50	6.00
ler, Brass-Lined	7.50	9.50
ler Gasket .....	.25	.30
arrel and Crank Case, no Heads	9.00	10.00
arge Flange .....	.50	.75
Gasket .....	.18	.18
t, each	2.00	2.00
Gasket .....	.40	.40
w Stuffing-box .....	.50	.50
Stuffing-box or Cap .....	.50	.50
Stuffing-box Gasket .....	.05	.05
for One Pulley	4.00	4.00
for Two Pulleys	4.75	4.75
for Long Shaft .....	.50	.50
e complete	5.00	5.00
and Rod	1.00	1.00
or Plunger only	5.50	6.50
r Pitman with Straps and Bolts	3.00	3.50
or Follower for Deep Well	2.50	3.00
Rod for Set	1.50	1.75
er Bail only .....	.25	.25
Poppet only	1.50	1.75
Leather .....	.75	1.00
Leather .....	.11	.15
ete Set of Packings .....	.40	.60
each	1.75	2.00
	.08	.08

Grindstone Frames

Figs. 144, 145, 162, 163

TO SWING STONE 4 x 30 INCHES

Trough	\$10.00
Legs, each, Fig. 145	1.50
Treadle Legs, each, Fig. 144	1.75
Guide for Treadle, Fig. 144	.50
Treadle only, Fig. 144	1.25
Pitman only, Fig. 144	.75
Pulley	2.50
Shaft, Fig. 145, with Nuts and Flanges	4.50
Shaft only, Fig. 145	3.25
Nuts, each	.30
Flanges, each	.35
Dog, for Foot Power with Set-Screw	.50
Bearings, each	1.00
Tool Rest complete	1.75
Back Dasher	1.25
Hand Hole Plate	.50
" " Studs, each	.25
" " Thumb Nuts, each	.15

Hydrants, Street Washers, Etc.

Figs. 240, 243, 375, 380, 396, 402, 412

Diameter of Pipe—Inches	$\frac{3}{4}$	1
Fig. 240 Upper Cylinder	\$2.50	\$2.50
Head or Top Cap	.50	.50
Brass Thread Screw	1.25	1.25
Handle	.30	.30
Malleable Jack	.30	.40
Malleable Tee	.30	.30
Brass Spout	.75	1.00
Brass Spout Lock Nut	.25	.25
Iron Slide for Spout	.25	.25
Collar or Sleeve, with Set-Screws	.65	.75
Brass Case, or Lower Cylinder only	1.25	1.75
Brass Piston or Stop with Leathers	1.00	1.50
Cupped Piston Leather	.10	.10
Flat Piston Leather	.05	.05
Brass Screw for Bottom of Piston	.08	.08
Brass Poppet or Check-Valve	.75	.75
Brass Spring for Check-Valve	.25	.25
Lower Iron Valve Chamber or Bottom only	.75	.75
Iron Bottom complete with Brass Case and Check-Valve	2.50	3.00
Bolts and Set-Screws, each	.08	.08
Brass Nipple for Inlet	.25	.40
Inlet Coupling and Tube	.40	.50
Brass Solder Tube only	.25	.35
Fig. 243 Top complete with Cover and Inside Plate	\$2.25	\$2.25
Top Box only with Cover	1.75	1.75
Cover only	.40	.40
Inside Plate only	.25	.25
Brass Cap Screws for Inside Plate, each	.20	.20
Malleable Jack	.50	.50
Malleable Key or Handle	.25	.25
Brass Thread Screw	1.25	1.25
(For other parts see Fig. 240.)		
Fig. 412 Head or Top Cap	\$0.50	\$0.50
Malleable Handle or Lever	.35	.35
Brass Catch or Hook	.15	.15
Heavy Spring	.65	.65
Light Spring	.15	.15
(For other parts see Fig. 240.)		

Hydrants, Street Washers, Etc. *Continued*

Figs. 240, 243, 375, 380, 396, 402, 412

Diameter of Pipe—Inches.....	$\frac{3}{4}$	1
Fig. 375 Iron Spout with Glands complete	\$1.75	\$2.15
Iron Spout only .....	.60	.75
Large Brass Gland .....	.75	.90
Small Brass Gland or Stuffing-box .....	.50	.65
Brass Valve-Stem .....	.50	.75
Iron Hand-Wheel .....	.15	.15
Brass Hand-Wheel Screw .....	.08	.08
Piston complete with Leathers	1.00	2.00
Piston, Rod, Valve-Stem and Hand-Wheel complete for 3-foot hydrant.	2.25	3.50
Brass Casing or Lower Cylinder	2.00	3.50
Brass Casing with Piston	3.00	5.50
Piston Sleeve Packing .....	.20	.20
Piston Flat Packing .....	.03	.05
Brass Screw for Bottom of Piston .....	.10	.10
Iron Sleeve with Set-Screw .....	.50	.65
Malleable Street Ell .....	.10	.15
Inlet Coupling and Tube .....	.40	.50
Brass Solder Tube only .....	.25	.35
Fig. 380 Top complete with Cover and Glands	\$2.25	\$2.75
Top Box only .....	.65	.85
Top Cover only .....	.30	.30
Large Brass Gland .....	.90	.90
Small Brass Gland or Stuffing-box only .....	.75	.75
Brass Valve-Stem .....	.75	.75
(For other parts see Fig. 375.)		
Fig. 402 Jacket complete.....	\$1.25	\$1.75
(For other parts see Fig. 375.)		
Fig. 396 Upper Cylinder with Head and Stuffing-box	\$8.00	
Upper Cylinder only	4.50	
Head with Gland and Stuffing-box	3.50	
Head only	1.00	
Gland only	1.50	
Stuffing-box only	1.00	
Loose Cone or Cap .....	.75	
Top Nut .....	.25	
Wrench or Handle .....	.50	
Discharge Nipple	1.25	
Hose Cap .....	.50	
Lower Cylinder only, Brass-Lined	4.00	
Brass Piston Screw	3.00	
Iron Piston, with Leathers	2.00	
Piston and Rod complete to 4-foot hydrant.	7.00	
Piston Leathers, per set .....	.20	
Bottom Globe or Valve Case with Poppet, etc.	4.00	
Valve Case only	2.00	
Poppet only	1.00	
Spring only .....	.25	
Valve-Seat only	1.00	
Lower Outside Shell or Sleeve with Set-Screws	3.00	

Hydraulic Ram

Fig. 77

Number.....	2	3	4	5	6	7	10
Diameter Drive Pipe—Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	2	$2\frac{1}{2}$	$2\frac{3}{4}$	4
Diameter Discharge Pipe—Inches	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	2
Impetus Valve complete	\$3.00	\$4.00	\$5.00	\$8.00	15.00	20.00	60.00
Brass Poppet only	1.50	2.00	2.50	3.50	6.00	8.00	20.00
Brass Case only	1.50	2.00	2.50	4.50	9.00	12.00	40.00
Top Nut for Poppet .....	.25	.25	.40	.40	.60	.60	1.00
Adjusting Nut .....	.50	.60	.75	.90	1.00	1.25	2.50
Lock Nut .....	.25	.25	.40	.40	.60	.60	1.00
Air-Barrel	3.00	3.75	4.50	8.00	15.00	20.00	60.00
Bottom or Base	3.00	3.75	4.50	7.00	13.50	18.00	50.00
Inside Valve complete with Clamp and Screws .....	.35	.35	.50	.50	.80	1.00	2.90
Inside Clamp only .....	.08	.08	.08	.08	.10	.15	.25
Inside Brass Set-Screw only .....	.08	.08	.08	.08	.08	.08	.12
Inside Valve with Weight and Screw .....	.25	.25	.38	.38	.65	.85	2.50
Inside Valve Leather .....	.10	.10	.18	.18	.30	.40	1.75
Inside Valve Weight, Screw and Washer .....	.15	.15	.20	.20	.35	.45	.75
Drive Coupling .....	.25	.28	.30	.50	1.00	1.25	3.00
Discharge Coupling .....	.20	.25	.25	.30	.50	.75	1.00
Blank Coupling .....	.15	.20	.20	.25	.40	.60	.75
Set of Bolts and Nuts complete .....	.85	.90	.95	1.00	1.25	2.50	7.00
Air-Barrel Bolts and Nuts, per set	(4) .32	(4) .32	(4) .32	(4) .32	(4) .40	(4) 1.00	(8) 4.00
Impetus Valve Bolts and Nuts, per set .....	.25	.25	.25	.35	.40	.50	2.00
Drive Coupling Bolts, each .....	.08	.08	.08	.08	.08	.25	.50
Discharge Coupling Bolts, each .....	.08	.08	.08	.08	.08	.25	.50
Packing for Impetus Valve .....	.15	.18	.20	.25	.40	.60	1.00
" Air-Barrel .....	.20	.25	.30	.35	.50	.90	2.50
" Drive Coupling .....	.10	.10	.15	.15	.25	.30	.75
" Discharge Coupling .....	.10	.10	.10	.10	.15	.20	.25
Set of Packings, complete .....	.50	.55	.65	.75	1.15	1.75	4.00

Working Cylinders

Figs. 229, 230, 231

Diam. of Cylinder—Ins.	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{2}$	5
Dis-charge Cap, Iron	\$0.55	\$0.57	\$0.60	\$0.62	\$0.65	\$0.70	\$0.75	\$0.85	\$0.95	\$1.25	\$1.50
Brass	1.65	1.70	1.80	1.90	2.00	2.10	2.25	2.50	2.90	3.75	4.50
Valve-Seal, Iron .....	.60	.62	.65	.70	.75	.85	.95	1.15	1.20	1.50	2.00
Brass	1.80	1.85	1.95	2.10	2.25	2.55	2.85	3.45	3.60	4.50	6.00
*Plunger only, Fig. 229, Iron .....	.52	.60	.75	.90	1.00	1.25	1.50	1.65	1.75	1.00	...
Brass	1.20	1.35	1.65	2.05	2.25	2.75	3.50	...	...	...	...
†Plunger only, Fig. 231, Iron	1.60	1.72	1.85	2.00	2.15	2.25	2.50	2.75	3.15	4.00	5.00
Brass	2.40	2.55	2.70	2.90	3.25	3.65	4.10	4.60	5.10	6.00	8.50
Long Iron	1.75	1.87	2.00	2.15	2.30	2.50	2.75	3.00	3.50	4.50	5.50
Long Brass	2.75	2.87	3.15	3.50	3.90	4.35	4.75	5.25	5.75	7.00	10.00
Plunger Rod only, 10- and 12-inch stroke ..	.15	.15	.15	.15	.15	.20	.20	.20	.20	...	...
Galvanized .....	.25	.25	.25	.25	.25	.35	.35	.35	.35	...	...
Plunger Rod only, 14- 16-, 18-inch stroke ..	.20	.20	.20	.20	.20	.25	.25	.25	.25	...	...
Galvanized .....	.30	.30	.30	.30	.30	.40	.40	.40	.40	...	...

Working Cylinders *Continued*

Figs. 229, 230, 231

Diam. of Cylinder—Ins.	2	2½	3	3½	4	4½	5	6	8	10	12
Plunger Poppet only.											
Iron.....	\$0.10	\$0.10	\$0.12	\$0.15	\$0.18	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40	.....
Brass.....	.30	.20	.35	.45	.55	.60	.75	.90	1.05	1.25	.....
Cap Ring Leather only	.11	.11	.11	.11	.11	.15	.15	.15	.20	.20	\$0.25
Plunger Leather only..	.11	.11	.11	.11	.11	.15	.15	.15	.20	.20	.25
Lower Valve Lea. only	.11	.11	.11	.11	.11	.15	.15	.15	.20	.20	.25
Lower Valve complete.											
Iron.....	.26	.26	.26	.26	.26	.30	.35	.40	.45	.45	.50
Brass.....	.36	.36	.36	.36	.36	.45	.50	.60	.65	.65	.70
Valve Weight, Screw, etc.											
Iron.....	.15	.15	.15	.15	.15	.20	.20	.20	.25	.25	.25
Brass.....	.25	.25	.25	.25	.25	.35	.35	.40	.45	.45	.45
Bolts for 10- and 12-in. Cylinder—each.....	.20	.20	.20	.20	.20	.20	.20	.25	.25	.25	.35
Bolts for 14-, 16- and 18-in. Cylinder, each.	.25	.25	.25	.25	.25	.25	.25	.30	.30	.30	.40
10-inch Cylinder—											
Iron.....	1.12	1.37	1.62	1.87	2.00	2.25	2.87	3.50	4.00	5.00	6.00
Brass-lined.....	2.75	3.00	3.25	3.50	3.75	4.00	4.25	5.00	5.00	5.00	6.00
Cast Brass.....	4.00	4.50	5.00	5.75	6.50	7.25	9.00	10.50	12.00	15.00	18.00
Brass Tube.....	3.50	3.75	4.00	4.25	4.75	5.00	5.50	6.75	6.75	6.75	7.75
Porcelain-lined.....	2.12	2.37	2.62	2.87	3.00	3.75	4.12	4.75	5.50	6.50	7.75
12-inch Cylinder—											
Iron.....	1.35	1.65	2.00	2.25	2.40	2.70	3.40	4.20	4.75	6.00	7.25
Brass-lined.....	3.15	3.65	4.00	4.25	4.50	5.00	5.35	6.20	6.20	6.20	7.25
Cast Brass.....	4.75	5.25	6.00	7.00	8.00	9.00	10.50	12.00	15.00	18.00	22.00
Brass Tube.....	4.00	4.25	4.50	4.75	5.25	5.75	6.25	7.25	7.25	7.25	8.00
Porcelain-lined.....	2.55	2.85	3.20	3.45	3.60	4.20	4.90	5.70	6.50	7.75	9.00
14-inch Cylinder—											
Iron.....	1.60	1.90	2.30	2.62	2.80	3.15	4.00	4.90	5.50	7.00	8.50
Brass-lined.....	4.25	4.40	4.70	4.90	5.30	5.85	6.20	7.35	7.35	11.50	17.00
Cast Brass.....	5.50	6.12	7.00	8.15	9.30	10.50	12.25	14.00	17.50	21.00	25.00
Brass Tube.....	4.75	5.00	5.25	5.50	6.25	6.75	7.25	8.00	10.50	17.00	25.75
Porcelain-lined.....	3.00	3.30	3.70	4.00	4.20	4.90	5.75	6.65	7.25	9.00	10.00
16-inch Cylinder—											
Iron.....	2.00	2.40	2.80	3.20	3.50	3.80	4.60	5.60	6.25	8.00	9.75
Brass-lined.....	4.50	4.75	5.05	5.40	5.80	6.30	6.65	7.85	8.75	12.25	19.50
Cast Brass.....	6.30	7.00	8.00	9.30	10.60	12.00	14.00	16.00	20.00	24.00	28.50
Brass Tube.....	5.25	5.50	6.00	6.25	7.00	7.50	8.25	9.00	11.00	19.50	29.75

*Fig. 229 Plunger is used on all kinds of Figs. 229 and 230 cylinders up to and including 12 inches long, except Brass Tube Fig. 230, which uses this plunger only on the 10-inch length.

*Pumps in this group having iron cap and seat take iron plunger.

†Fig. 231 Short Plunger is used on 10-, 12- and 14-inch Fig. 231; on 14-inch Figs. 229 and 230, also on 12-inch Fig. 230, when the cylinder is of brass tubing.

†Fig. 231 Long Plunger is used on all kinds of 16-inch cylinders. The Fig. 231 Plungers have always a brass bail and poppet.

†Pumps in this group having iron cap and seat take plunger with iron follower.

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